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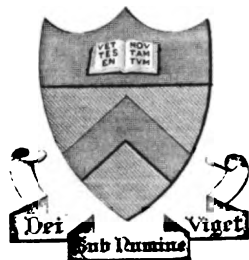
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OF THE

DEPARTMENT OF THE INTERIOR

FOR THE

FISCAL YEAR ENDED JUNE 30, 1898.

MISCELLANEOUS REPORTS.

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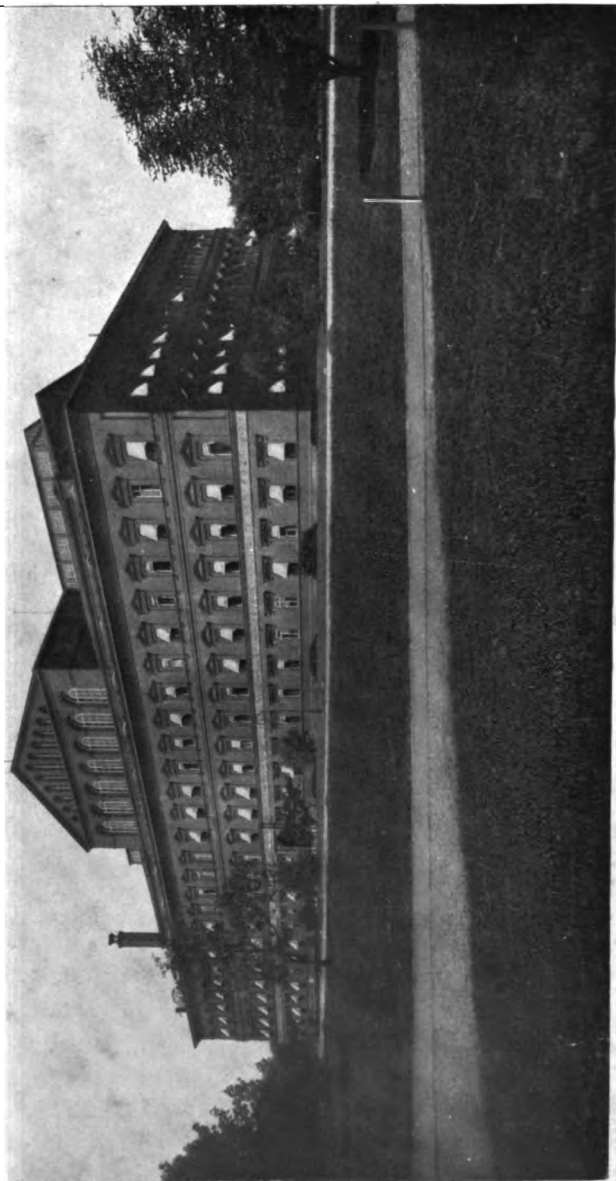
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U. S. PENSION OFFICE (SOUTH FRONT), WASHINGTON, D. C.

REPORT OF THE COMMISSIONER OF PENSIONS.

DEPARTMENT OF THE INTERIOR,
BUREAU OF PENSIONS,
Washington, D. C., August 31, 1898.

SIR: I have the honor to submit the following report of the operations of the Bureau of Pensions for the fiscal year ended June 30, 1898:

TABLE No. 1

shows the number of pensions allowed, the number increased, the restorations, the dropped, the annual value of each class, the total number of pensioners, and the total annual value of the rolls.

There were added to the rolls during the year 52,648 new pensioners, and there were restored to the rolls 4,089 that had been previously dropped, making a total of 56,737. To this number must be added 6,852 originals and 762 restorations (that were held in the Bureau and not entered on the agency rolls until after July 1, 1897), making 7,614, or 64,351 to be added to the 976,014 on the rolls June 30, 1897, making a total of 1,040,365.

During the same period the losses to the roll were as follows:

By death	33,691
By remarriage	1,369
By expiration of minority period.....	2,124
Failure to claim.....	3,031
Other causes.....	6,436
Total losses.....	46,651

leaving the number on the rolls June 30, 1898, 993,714, showing a net gain over June 30, 1897, of 17,700.

Death losses by classes.

	Survivors.	Widows.	Nurses.
Wars prior to 1861.....	1,120	1,006	.....
Wars since March 4, 1861	21,811	9,727	27
Total.....	22,931	10,733	27

At the close of the year, June 30, 1898, the annual value of the roll was \$130,968,465. June 30, 1897, the annual value of the roll was \$129,795,428, showing an increase of \$1,173,037; so that the roll is not only increasing in numbers, but in values. It is believed that the roll will increase from the war of the rebellion, as there are probably 200,000 ex-Union soldiers living who have never had pension. The roll will increase in amount naturally by reason of increased disabilities as provided by law.

Your attention is invited to the several statistical tables submitted herewith, and each has been given relatively the same number as the corresponding table had in the annual report submitted to you last year—this, in order that the same may be readily compared.

The total number of pensioners classified and compared for the years 1898 and 1897 are as follows:

	1898.	1897.
Widows, Revolutionary soldiers	5	7
Daughters, Revolutionary soldiers	7	9
Survivors of war of 1812	3	7
Widows, war of 1812	2,407	2,810
Survivors, Indian wars, 1832-1842	2,019	2,353
Widows, Indian wars, 1832-1842	4,067	4,288
Survivors, Mexican war	10,012	10,922
Widows, Mexican war	8,143	8,072
Under general laws:		
Army invalids	327,080	336,299
Widows, army	92,545	94,602
Navy invalids	4,833	4,788
Widows, navy	2,300	2,375
Act of June 27, 1890:		
Army invalids	399,366	378,609
Army widows	119,785	110,593
Navy invalids	14,543	13,831
Navy widows	5,944	5,766
Army nurses	655	663
Total	993,714	976,014

It will be found on further examination that they were divided on the rolls June 30, 1898, as follows:

	Survivors.	Widows.
On account of old wars	12,034	14,629
On account of general laws	331,913	95,500
Act of June 27, 1890	413,909	125,729
Total	757,856	235,858

It will be observed by reference to Table No. 1 that there were 26,760 certificates of straight increase issued during the year.

The amounts paid out at the several agencies for the year on account of those pensioned under all other laws were \$78,396,209.13, and on account of those pensioned under the act of June 27, 1890, \$66,255,670.67.

TABLE No. 2

shows the number of pensioners dropped from the rolls for various causes, and compared with the previous year. They were as follows:

Year.	By death.	Remarriage.	Minors.	Failure to claim.	Other causes.
1898	33,691	1,369	2,124	3,031	6,436
1897	31,960	1,074	1,845	2,683	3,560

Those represented in the death column include, of course, widows as well as invalids.

"Failure to claim" covers those that for some cause have permitted their pensions to remain three years without drawing, when, pursuant to law, they were dropped. The cause may have been "death" or "remarriage," but information of the fact failed to reach the disbursing agent.

"Other causes." This covers those dropped by force of law, and those that get pensions granted for some period in the past and who have no permanent pensionable status. For instance, widows and minors, whose title to pension terminated prior to the issue of their certificates, get but one payment, go on the rolls as original pensioners for the one payment, and then are dropped.

The droppings for the fiscal year just closed are increased somewhat by a partial checking up of the rolls of the Philadelphia and Boston agencies, whereby a considerable number of deaths, remarriages, etc., were found and the pensioners dropped where, in the regular course of business, they would not have been dropped during the past year.

TABLE No. 3

shows the appropriations and disbursements for the year.

The disbursements were for pensions on account of Army and Navy, \$144,651,879.80, to which add cost of disbursements and fees of examining surgeons, \$1,207,515.51, and salaries and per diem expenses of the Bureau, \$2,683,212.54, and we have a gross expenditure of \$148,542,607.85. In addition to this there was paid a balance due on account of medical examiners for the last quarter of 1897, \$223,363.41, or a gross expenditure during the year of \$148,765,971.26.

TABLE No. 4

shows the amount disbursed at each of the several agencies.

TABLE No. 5

is statement of amount paid for pensions under the general law at each of the several agencies.

TABLE No. 6

is statement of the amount paid for pensions under the act of June 27, 1890, at the several agencies.

TABLE No. 7

is statement showing amounts paid for pensions to the survivors and widows of the war of 1812 since 1871; of the war with Mexico since 1887, and of the Indian wars since 1893.

TABLE No. 8

shows the number and amount paid as first payments in each class of certificates issued during the fiscal year of 1898. It also shows that there remained in the hands of the pension agents unpaid at the end of the year, 5,081 cases of all classes, under which there was due as first payments the sum of \$760,212.24. The average value of all original payments during the year was \$206.36. The average value of all original payments in the general-law cases was \$408.97. The average value of all original payments under the act of June 27, 1890, was \$177.54. This table also shows that the amount withheld from pensioners and paid as fees to attorneys during the year was \$730,019.36.

TABLE No. 9

is a classified statement of the number of pensioners on the rolls at each agency, showing the increase and decrease of each class for the year, with a net increase of 17,700 for the year.

TABLE No. 10

is a statement showing the disbursements for pensions, fees of examining surgeons, cost of disbursement, salaries, and other expenses of the Bureau for each fiscal year since July 1, 1865.

TABLE No. 11

shows the original pension claims filed and allowed each year since July, 1861.

TABLE No. 12

shows the number of pensioners in each State and Territory and in foreign countries, with the amount paid opposite.

The number of pensioners in foreign countries at the close of the fiscal year was 4,371, having increased 309 during the year.

The total amount paid to pensioners living abroad, during the year was \$669,862.56. In 1897 it was \$619,945.88.

It will be observed that the average amount paid to each pensioner for the year, living abroad, was \$153.25, while the average annual value of all pensions on the rolls June 30, 1898, was \$131.79.

There is a **lack of system** in the established practice of this Bureau in securing the **necessary original** and continued identification of the pensioner with the **service**, as also in securing notices of deaths, remarriages, and **necessary information** for droppings from other causes, of those living in **foreign countries**. This Bureau has no supervision or criminal jurisdiction over pensioners living in foreign countries.

TABLE No. 13

is a statement showing, by classes, the different monthly rates paid to pensioners, and the number at each rate on the rolls June 30, 1898, also under the act of June 27, 1890, with explanation covering those cases appearing under the latter, who are drawing in excess of \$12 per month, that being the maximum allowed under said act of June 27, 1890; also same for war of 1812, war with Mexico, and Indian wars.

There were 17 survivors and 211 widows of the Indian wars, and 46 survivors and 592 widows of the Mexican war pensioned during the year.

TABLE No. 14

shows the names and residence addresses of the surviving widows (5) and daughters (7) of the American revolution. The annual report of 1897 showed 7 widows and 9 daughters. In the past year 2 widows and 2 daughters have died.

TABLE No. 15

shows the names and residence addresses of the survivors of the war of 1812. At the close of the year 1897 the same table showed 7 survivors. During the past year 4 of these have died. There are now 2,407 widows of the war of 1812, when in 1897 there were 2,810. One survivor (dead; payable to his widow) and 7 widows of the war of 1812 were pensioned during the year just closed.

TABLE No. 16

is a report of pension certificates issued during the year, in all 98,574. There were 3,741 army and navy invalids and 4,335 army and navy widows pensioned under the general laws, a total of 8,076. There were 28,776 army and navy invalids, and 14,971 Army and Navy widows pensioned under the act of June 27, 1890, making a total of 43,747; and there were 825 pensioned under other laws, for Indian wars, Mexican war, and the war of 1812, making a total of 52,648 new or original pensions.

There were 1,833 under the general law, and 2,246 under the act of June 27, 1890, making a total of 4,089, restored to the rolls who had been previously dropped. There were 26,760 straight increases, 11,077 reissues, accrued and other issues.

TABLE No. 17

shows in detail the operations of the mail division of this Bureau.

I desire to call your attention to the growth of the work in this division, it being an index of the growth of the work of the Bureau. For the fiscal year 1896 there were 2,162,581 pieces of mail handled, received, and sent. For the year 1897 there were 5,056,768; and for the year 1898 there were 6,566,967, or 30 per cent increase during the past year over the preceding year, and more than 300 per cent over the year 1896.

The Congressional calls and letters of inquiry have increased from 799,000 in 1896 to 841,000 in 1897, and 1,234,000 in 1898, showing an increase of about 50 per cent for the last year over the preceding year.

There were sent out 2,054,048 letters (not including cards) during the past year, as against 1,542,101 the preceding year, an increase of about 33½ per cent.

TABLE No. 18

shows, very briefly, the work of the army and navy survivors' division.

In this division are kept, so far as it is practicable to secure them, the names of all of the survivors of the war of the rebellion, their service, and their present post-office addresses, on the card system.

TABLE No. 19

is a report itemizing the number of claims of all classes pending on June 30, 1898. There were 635,059 claims pending. On June 30, 1897, there were 578,099. The largest number pending was January 15 last, when there were 651,668. Since that date 16,500 more claims were allowed than were filed. Of the pending claims, 200,000 or thereabouts are called original claims, while the remainder, 435,000, are claims for increase, rerating, etc.

It is hardly fair to say that there are 200,000 original claims pending, awaiting adjudication. I am confident that there are not over 75,000 of these (invalids and widows) that are genuine original claims, as an original claim should be understood. The other 125,000 are claims (invalids and widows) where the claimants are already pensioned under the act of June 27, 1890, and have claims pending under the general law to establish claim for disability as being of service origin.

When the disability act of June 27, 1890, passed it provided a minimum pension of \$6 per month and a maximum pension of \$12 per month. There were at that date about 100,000 pensioners on the rolls drawing less than \$6 per month. Many of these were transferred to the new law and received the benefits of this law, and the law did not deprive them of the privilege of continuing the claim under the general

law. When the pensioner's established disability increased, or an additional disability of service origin was proven, until the ratable disability was established in excess of the maximum rate under the act of June 27, 1890, then the pensioner could be transferred back to the list of pensioners under the general law. Many claimants had claims pending that first accepted the benefits of the act of 1890, in the meantime continuing the prosecution of their respective claims under the general law.

A claim filed and rejected, under the established practice, is still pending. In other words, many of the pending claims have been rejected from one to ten times or more, though still being on the records as pending. Many of these claims have been rejected by several Commissioners, have been carried on appeal from time to time to the Honorable Secretary of the Interior, and the Secretary sustained the action of the Commissioner; and yet the claim continued, under the practice, as pending.

I make this explanation to show that it is not fair to say that there are 200,000 original claims pending, although the records indicate this. Many are duplicated. One claimant already pensioned may have another original claim pending under another law; but no one can draw, under the law, two pensions for different services.

TABLES NOS. 20 AND 21

relate to the report of the chief of the special examination division, and cover, from a comparative standpoint, Tables 19 and 21 of the fiscal year of 1897.

It is believed that the division has rendered good service to the claimants as well as to the Government.

There were 15,000 claims referred to this division during the year and sent to the examiners in the field for careful examination. Many of these were claims long pending—the claimants and their comrades long separated—but through the aid of the army and navy survivors' division in locating comrade-witnesses, the claims have been sent out to the examiners in the field, when these witnesses lived often in remote sections, and evidence found to complete the claims. The service has in this way endeavored to do justice to all claimants, and many just claims have been admitted that would otherwise have been rejected.

This report gives a careful résumé of the work of that division.

TABLE No. 22

is report of the law division.

It affords me pleasure to call your attention to the report of the chief of this important division. It is as brief as it could be made, covering so well the volume of business transacted in the division.

I furnish for your information and consideration the following additional tables, exhibits, and reports for the year:

TABLE NO. 23.

As per your request, I submit a report showing the number of special acts of Congress granting pensions, beginning with the Thirty-seventh Congress (1861-1863) and ending with the Fifty-fourth Congress (1895-1897), showing the number of special acts of each Congress, the number each Congress pensioned, and the rate of each pension so granted, the total number pensioned being 6,097.

No convenient records having been kept of the details of each case, I can only furnish the number, instead of the name and service of the pensioner.

TABLE NO. 24

is an itemized list of special acts passed by the second session of the Fifty-fifth Congress, showing the passage of 394 bills. The name of each beneficiary is given, the service, the rate by special act, and the former rate, when pensioned. I follow this table with a recapitulation, giving number granted at each rate. You will note that one act was the repealing of a former act whereby a special act had been secured through fraud. Two were inoperative for the reason that the intended beneficiaries were already receiving the same rates, and two were dead. So that there were, net, 389 instead of 394 names added to the rolls.

TABLE NO. 25

shows claims filed during the year.

There were original applications for pension filed as follows:

Invalids:

Army, under general law.....	5, 722	
Navy, under general law.....	802	
Army, under act June 27, 1890.....	18, 612	
Navy, under act June 27, 1890.....	2, 719	
		27, 855

Widows:

Army, under general law.....	9, 947	
Navy, under general law.....	340	
Army, under act June 27, 1890.....	17, 026	
Navy, under act June 27, 1890.....	805	
		28, 118

Total original claims filed.....	55, 973
----------------------------------	---------

Table No. 11 shows only 37,524 original applications filed, hence an explanation is necessary, there being a difference of 17,449 claims. This shows that there have been this number of duplicate original claims filed, the claimants filing under the act of June 27, 1890, for disabilities incurred since the war or military service, and also a claim under the general law for a disability or disabilities of service origin. The record division shows all original claims filed, while Table 11

shows the number of claimants. Much time of the Bureau is thus spent in the adjudication of two claims for one claimant. This explanation will account for the seeming discrepancy between the two reports.

In addition to the original claims filed, there were 56,354 applications for increase under the general law, and 53,125 under the act of June 27, 1890, making a total of 109,479 claims for increase (this includes 3,622 Navy claims), making a total of 165,442 claims (original and increase) filed during the year. The report of the chief of the record division, Table No. 25, shows that there were 41,543 duplicate claims filed under the act of June 27, 1890, and 3,610 duplicates filed under the general law during the year, making a total of 45,153.

TABLE NO. 26

is report of the medical referee, to which your attention is requested.

An appropriation of \$700,000 was made to pay fees for medical examiners throughout the country for the fiscal year ended June 30, 1898. This amount was found to be insufficient, and an additional appropriation of \$250,000 was asked for and made by Congress.

There are now in the service 4,663 medical examiners (see Exhibit A, 26), viz, 202 boards, 3 surgeons each, within the classified service, 606; 1,216 boards, 3 surgeons each, not within the classified service, 3,648; single surgeons and specialists, 409.

There is much complaint among pensioners, and very just cause for such, by reason of the lack of uniformity of ratings for the same or like disabilities in cases of different claimants. This complaint has always existed and always will with our present system and established practice, and it can not be remedied without radical change of system.

The medical examinations form the basis, the very foundation, of our whole system, as all pensions to soldiers (under the act of July 14, 1862, and the act of March 3, 1873—the general laws) are based upon disabilities incurred in the service, while those pensioned under the act of June 27, 1890, must show, by medical examination, that their disabilities (not of service origin) are such that they are incapacitated from making a living by manual labor; and, further, having once established a ratable disability, future increases depend upon medical examinations.

The practice requires that medical examiners shall make a diagnosis and complete and accurate pen-picture of the disability or disabilities of the claimant; and although the medical examiners may be learned in medicine and skilled in surgery, they have had no special training for this particular service, no training in the pension laws, schedules, ratings, and established practice of the Bureau; and very many of them (the compensation being so small) can not afford to neglect their practice to familiarize themselves with the laws and rules governing the actions of the Bureau. They are paid a small fee for each examination and detailed report, and such examination is very often, no doubt, hurried and superficial. Therefore, many test examinations are made.

As an illustration: This Bureau recently found it necessary to cause a test examination to be made of a pensioner. He was sent before four medical boards, three members each, all present. All of these boards were within the classified service. Each examined the pensioner under the same instructions. Each board made a careful examination and reported the results of their investigations with the usual care, describing the pensioner's disabilities from their standpoint. Each board found unanimously; no minority report. The results, summed up briefly, were: One board could find no ratable disability; another found a ratable disability and estimated it at \$8 per month; another board found disability, carefully described it, and rated it at \$17 per month, while the other board made equally as careful examination and estimated the claimant's disabilities as third grade—\$24 per month. Same man, same conditions, same instructions, and all within forty-eight hours. These physicians are each and all, I am informed, skilled in their practice—in every way reputable practitioners.

This one illustration is submitted for your consideration as evidence that the very general complaint against the uniformity in the medical examiners' description of the disabilities, and in their ratings, is beyond the control of this Bureau, under the present laws and established practice. When a claimant is examined before a medical board and no ratable disability is found he becomes dissatisfied with the action of the Bureau. The rejection of the claim by this Bureau naturally causes him to complain, and thereupon he asks that the claim be reopened, and that he be ordered for another examination before another board, and continues until some board estimates and describes his disabilities to meet his expectations.

It is beyond the power of this Bureau, under the long established and existing system, to cause uniform ratings for like disabilities, though the very greatest care is exercised by the Bureau and skilled men employed to examine papers as reported by the 4,600 physicians employed throughout the country.

TABLE No. 27

is a report of the chief of the board of review.

Your attention is respectfully invited to the statistics therein given so briefly and concisely, this being the legal branch of the service in the adjudication of all claims, and therefore very important.

As will be seen, this division handled during the year 232,065 claims. Of this number 51,676 that had been forwarded from adjudicating divisions were examined, and finding that they were incomplete were returned to the several adjudicating divisions for calls to be made for additional evidence. There were 95,760 claims allowed, while there were 85,629 rejected. This includes rejections of claims for higher rates, making a total of 181,389 claims adjudicated by the board of review during the year, an average of over 600 per day for each working day.

There were 12,057 notices of appeal taken by the claimants (none by the Government) from the decisions of former Commissioners and those of the present Commissioner. It will be seen that the Bureau reexamined, reconsidered, and readjudicated 67 of these on legal grounds, and 433 on medical grounds, making a total of 500 cases. The remaining 11,557 on reexamination, could not be reconsidered by this Bureau, and were therefore carried to the Honorable Secretary of the Interior on appeal.

It affords me pleasure to say that you sustained the action of this Bureau in 3,326 cases acted upon, and only reversed the action of this Bureau in 396 cases, and in these reversals no precedents are set to change the established practice of the Bureau. Each case, according to your instructions, must be considered on its individual merits, and in accordance with the established practice.

The number of cases remaining in your hands on appeal at the close of the year being 7,835, the report of the board of review shows the accuracy of the work performed.

Of the total number of claims adjudicated, about 15,000 were of that class that go to the special examination division and then to the field for examination and further evidence. The remainder, 166,000 and over, were acted upon without special examination. The 85,629 cases rejected go to the pending files for future consideration.

TABLE No. 28

is a statement showing the value of the pension roll on June 30 of each year and amount paid the following fiscal year. (See footnotes in table, to which your attention is invited.)

TABLE No. 29

shows number of employees and amounts appropriated for salaries for special examiners from July 1, 1864.

TABLE No. 30

is the annual report of the chief clerk of the Bureau, containing much valuable and statistical information.

PENSION AGENCIES.

There are eighteen pension agencies. (See Table No. 4.)

For the year 1898 Congress saw fit to reduce the appropriation for clerk hire in the several agencies from \$450,000 to \$430,000, again to be reduced in 1899 to \$415,000, or a fraction more than 40 cents per annum each for clerk hire, to pay each pensioner four times per year and keep all necessary records.

An effort has been made to get the agencies located in public buildings so far as practicable. Also, reasonable reductions have been

secured in rents for such agencies as are located in other than public buildings. The following table shows the rates of rents for pension agencies during the fiscal year:

Name of agency.	1896.	1897.	1898.
Buffalo.....		2,928	1,500
Detroit.....	2,400	2,400	2,400
Indianapolis.....	2,500	2,500	1,500
Milwaukee.....	2,500	2,500	1,500
New York.....	10,000	10,000	5,000
San Francisco.....	1,872	1,872	1,300
Topeka.....	2,250	2,250	1,500
Washington.....	1,380	1,380	1,380
Total.....	22,902	25,830	16,080

The agencies at Augusta, Boston, Chicago, Concord, Des Moines, Knoxville, Louisville, Columbus, Philadelphia, and Pittsburg are all located in public buildings. It is expected that within a few months the agency at Detroit will be provided with quarters in a public building. Leases for the year 1899 have been entered into at same rates as those paid in 1898, with the exception of Detroit, that being temporary occupancy and per month.

The work of the agencies is in the hands of exceedingly competent officials, is well systematized, and payments are made very promptly.

I have recently instructed the several pension agencies to call upon pensioners living in cities having free delivery to furnish their residence addresses (street and number), in order to facilitate the delivery of their pension agency mail and meet the requirements of sections 370-376 of the Postal Rules and Regulations.

The attention of this Bureau was called to the fact that notaries public, magistrates, and others engaged in the business of taking acknowledgments of pensioners' quarterly vouchers for payment, were not always complying with the requirements of the law. The special examination division was directed to cooperate with the agencies, and through the field examiners make a tour of observation in the three groups paid by the agencies during the months of April, May, and June, and report to this Bureau the result of their work. Their reports have been received, and are quite voluminous, showing that many officials are, to say the least, careless as to the requirements of the law, by failure to require necessary identification of pensioners, in failure to require presentation of pension certificates by the pensioners at the time of taking such acknowledgments, and, further, in the use of professional or stock witnesses. The law is plain on these points. The object of this tour of observation was to see the practices, and correct irregularities, if any existed. Warning has been given to the officials, calling attention to the specific requirements of the law, and it is to be hoped that all this may be brought within the requirements of the law without applying the penalties as provided for in the act of July 7, 1898.

ACT OF JUNE 7, 1888.

Your attention is invited to the following extract from the pension laws:

The following provisions were enacted as a portion of the act making appropriations for the payment of invalid and other pensions of the United States for the fiscal year ending June thirty, eighteen hundred and eighty-nine, approved June 7, 1888:

That all pensions which have been, or which may hereafter be, granted under the general laws regulating pensions to widows in consequence of death occurring from a cause which originated in the service since the fourth day of March, eighteen hundred and sixty-one, *shall commence from the date of death of the husband. And provided further,* That all United States officers now authorized to administer oaths are hereby required and directed to administer any and all oaths required to be made by pensioners and their witnesses, in the execution of their vouchers for their pensions free of charge.

In my opinion this law is not consistent in its results with a well regulated system of pensions. (The proviso was reenacted March 1, 1889.) Up to the passage of this act, June 7, 1888, the widow's pension dated from the date of filing the claim, if the application was filed after July 1, 1880. No soldier's pension can go back of the date of its filing since July 1, 1880, under the act of March 3, 1879, known as the "arrearage act."

I know of no better way to bring to your attention the results of the administration of this law than to cite you illustrations of its workings.

It would seem that there were and are a large number of widows who had never been pensioned or filed claims for pension. Many of them at that date (June 7, 1888) had remarried, and before the passage of this law had no pensionable status on account of their remarriage without filing claim for pension. The soldier husband, by reason of wealth, pride, or other cause, had failed to file a claim for pension and the widow had not claimed pension, though she may have remained a widow for from one to twenty years or more. After remarrying, the successor to the soldier husband, by her claiming pension under the act of June 7, 1888, becomes the beneficiary of this Government's generosity to its defenders, it matters not what may have been his position during the war.

As an illustration of the established practice under the law, I give you the result, viz:

Claim No. —, —, —, captain in Company —, — Regiment — Volunteer Infantry, was honorably discharged. In 1871 this captain died. He was not a pensioner, and never had filed a claim for pension. His widow remained a widow until March 30, 1887, when she remarried, having filed no claim, and, having remarried, had no pensionable status. In 1893, five years after the act of June 7, 1888, had passed, six years after her remarriage, and twenty-two years after

the death of her soldier husband, she files her claim for pension as a widow, from the date of the death of her soldier husband in 1871 to the date of her remarriage in 1887—sixteen years—and gets nearly \$4,000, practically for the use and benefit of the second husband.

Another illustration:

Henry Jordan, Company —, — Regiment United States Colored Troops, died in April, 1867. His widow remarried in 1874. No claim had ever been filed. The youngest child became 16 years old in 1883. Claim was not filed until 1891, since allowed, carrying about \$2,000.

Many millions of dollars have been paid out on this class of claims. There seems to be no limit to the number. Only recently a claim was allowed that dated back to 1857. Another, recently filed, claims from 1852.

I am of the opinion that the operation of this law is contrary to the spirit or intent of a just and generous recognition of the soldier's service. I am, too, of the opinion that the widow's pension is intended to aid, assist, and comfort the soldier's widow during her widowhood. Again, this law has, with the aid and interpretation of designing persons, gotten the widow into trouble. In a Western State, a colored soldier died in the early 70's, leaving a widow. Soon thereafter the widow remarried. The second husband died a few years ago. The widow was advised to apply for a pension as the widow of her first husband, and pension was secured covering the whole period from the date of the death of her first husband. She is now serving a term in the penitentiary. Only recently the United States district attorney in a New England State caused the arrest of a woman whose soldier husband died in 1869. She remarried in 1870, filed her claim, established it by proof, and had it allowed in 1897, dating back to 1869, covering the period of her widowhood, as also that of her remarriage.

I have only stated these four cases to bring to your attention very briefly but plainly the operations of the law. Many, many could be recited.

MINORS.

Also, under section 4702, as amended by the act of March 3, 1879, minors who have arrived at the age of 30, 40, or more years are being pensioned for the period of their minority. Claims have been filed (and are still being filed), and many have been allowed, where they were not filed until the minor had long since passed the pensionable age of minority. In many cases the minor had married; and there are other cases where such minor had become widowed and even remarried. The widow may have remarried within a reasonably short time after the death of her soldier husband, having several young children as the soldier's minors, she having claimed no pension. The children may have grown up to mature manhood and womanhood, and, as I have said, may have married, possibly. The widow, at this late date, is

privileged to file a claim, and receive pension for herself during her widowhood, and for the minors, included in the widow's pension, until the youngest minor shall have become 16 years of age; or, if the widow has remarried, and has died without receiving any pension, then the minors may claim and receive the pension from the date of the soldier's death. This pension would continue until they reached the age of 16 years, no matter what might be their age at the date of the filing of the claim. This under the present established practice.

The practice has been changed from time to time in the past, Commissioners having held that the minor's pension must be claimed during the period of its minority. This has been sustained by the Secretary of the Interior, then again reversed, and so on, until the practice in the past has been irregular.

Your Commissioner is clearly of the opinion that the minor's pension was intended to aid, assist, and comfort the minor during the period of minority, and that it was not intended that the pension, either for the widow or the minor, was to be hoarded up and drawn in bulk years afterwards.

Section 4702 says the pension shall be paid "to his child or children until they severally attain the age of sixteen years, and no longer." So it is in the amended act of August 7, 1882.

Legislation should be had to the end that no pension should be granted to date prior to the date of filing the claim.

These old claims make it very difficult for this Bureau to deal promptly with the claimants and at the same time protect the interest of the Government and the honor and integrity of the pension roll.

DROPPINGS FROM THE ROLL.

I call your attention to the fact that, in the perfecting of the established practice of the Bureau, there is the lack of a system of registration whereby the agencies can secure prompt notice of deaths, remarriages, etc., of pensioners, hence a large number are found on the abstract each year as dropped (3,031 last year) by reason of failure to claim, the law being that if the pensioner fail to draw his or her pension for three years such pensioner is dropped from the rolls, on the presumption of death. So it is with remarriages and other causes, the pension agencies having no source whereby they can get the necessary data, excepting through calls upon the postmasters, or through volunteer sources. The 250 special examiners of this Bureau that are doing work in the field can render but little assistance, as they can know but a limited number of the pensioners, having no directory or registry for reference.

A well-matured system of county or district registration or annual identification would prevent experts from becoming the successors of the pensioners in drawing the pensions after the original pensioners were dead or remarried.

CIRCULARS—FAMILY HISTORY.

During the past year a circular letter, with questions and blanks for reply, was sent to each invalid pensioner, for the purpose of getting a statement from the pensioner himself as to his family—whether married or not, and if his wife is living, requesting her maiden name, when married, etc., together with the names of his children, if any, when born, names, etc.; this for the purpose of filing with his papers his own statement while in life, thereby enabling the Bureau to more readily and promptly adjudicate his widow's claim for pension, should such a claim be filed in the future, thus saving the widow much annoyance in securing data necessary to the passage of her claim.

PAYMENTS TO "UNFIT PERSONS."

I take pleasure in calling your attention to recommendation made by the Honorable Commissioner John C. Black, in his annual report for 1887, viz :

I respectfully recommend that the law be so altered and amended as that the Commissioner of Pensions shall be authorized to order the payment of pension to the wife of a pensioner, or to a suitable person in behalf of the children of a pensioner, in cases where the pensioner shows by his habits that he is an unfit person to receive or disburse such pension, or because of his incompetence, not arising, perhaps, to the degree of lunacy, but such as to prove him a spendthrift, or in cases where he is an inebriate, or in cases where his money is spent upon improper persons or in improper ways. The law as at present existing limits the power of the Commissioner very greatly in this particular, and authorizes him to direct payment to the wife or guardian only in cases of insanity, or other mental incapacity, or imprisonment for offenses against the laws. Payment so ordered made to any person other than the pensioner, for the benefit of the wife or children, should of course be made only upon bond, properly executed.

I commend this suggestion to your careful consideration. There are many men—good men—who are incapable of properly taking care of the generous bounty provided for them by the Government. Many instances are brought to the attention of this Bureau. In a report recently made by one of the efficient special examiners of this Bureau, where the pensioner will get, as a first payment, about \$4,500, the examiner sums up the case with the suggestion that the man would be better off with a small pension than a large one; that if he gets much it will be dissipated, and go to those who never served the cause of the Government, and bring trouble upon the pensioner and those dependent upon him.

REMARRIAGES.

The act of June 27, 1890, prohibits the granting of a pension to the widow (under this act) unless she was married prior to the passage of the act.

I took occasion last year to recommend that the laws granting pensions to widows of soldiers should be amended. After another year's

experience I am fully convinced that such legislation would be wise in the interest of the soldier pensioners, their good name, and in the interest of good morals.

A TREATISE ON BUREAU PRACTICE,

for the purpose of simplifying and having uniform the practice of the Bureau, and having it harmonious throughout.

A treatise has been prepared by the Bureau, and published by your Department, which, it is confidently hoped, will serve to facilitate to a great extent the settlement of pending claims by placing before examiners, as simply as practicable, the requirements of the Bureau in the different classes of claims, and thus enabling claimants and those who adjudicate these claims to proceed to their settlement in a more expeditious and intelligent manner.

LAW LIBRARY.

In the proper transaction of the business of the Bureau it is necessary daily to consult the laws of the different States and the decisions of the State courts interpreting such laws, as well as text-books relating to different branches of the law. Especially is this the case in questions relating to marriage, divorce, and guardianship.

The law library is exceedingly incomplete, and wholly inadequate to meet the demands of the service. I would therefore suggest that an appropriation of \$500 be asked for, to be applied to the purchase of law books necessary to be used in the work coming before the Bureau.

MEDICAL LIBRARY.

I have the honor to call your attention to the necessity of a better, more extensive, and a more modern library of standard works on medicine and surgery for the use of the medical division of this Bureau. For the ten years ending June 30, 1897, there were expended about \$125 for standard reference medical publications. Last year you generously allowed from the Department appropriation about the same amount, which was, I assure you, of very great service in securing a few standard publications; but the library is wholly inadequate for the demands of the service and responsibility of the work of the medical examiners of the Bureau. I respectfully suggest that an appropriation of \$300 be secured to purchase standard modern works on medicine and surgery.

REVISION OF THE LAWS.

Since the passage of the general law of July 14, 1862, there have been numerous laws amendatory, special and general, with the many rulings and decisions interpreting the laws, until the whole system is a most complex and wonderful network or labyrinth of laws and legal

opinions, to the end that a precedent may be cited for any action of this Bureau.

The importance of the work is such, and the demands upon the revenues of the Government so great, with a prospect of much greater in the near future, that I am of the opinion that, in order to secure reliable, intelligent, and uniform practice in the future, a commission should be appointed on the revision of the laws, rules, and regulations governing the issuance of pensions.

WAR WITH SPAIN.

A separate division is being organized for the adjudication of all claims growing out of the war with Spain; records are being prepared for registration of all these claims; an accurate account will be kept, so that in future actual results may be known, and existing conditions, without unnecessary delay.

It is expected that the date of the President's proclamation declaring war with Spain fixes the date of the beginning.

These soldiers will receive their pensions, under the general laws, for disabilities of a permanent character, contracted while in the service. The act of June 27, 1890, applies only to the war of the rebellion, excepting as to dependent parents.

Only a few claims (less than 100) have been filed up to the close of the fiscal year, and none has been adjudicated.

PENSION BUILDING.

I call your attention to the fact that an accumulation of tons upon tons of valuable papers and records occupy the whole of the fourth or upper story of this building, and these are known as the admitted files. The necessity for the preservation of these papers is apparent to all. Much trouble has been experienced from year to year by reason of a defective roof, and this each year requires more or less repairs.

The first, second, and third stories of the building, with one exception, are used for the offices and adjudicating divisions of this Bureau, and by reason of overcrowding and accumulation of papers more room seems to be an absolute necessity. There is no room or space that I can set apart for the use and occupancy of the new division for the adjudication of the Spanish war claims. The whole of the court is occupied with cases containing pending files. The basement, uninhabitable in its present condition, can not be used for the storage of papers because of its dampness.

I have the honor to recommend (1) that the space now occupied by the Commissioner of Railroads in this building be secured for the use and purposes of this Bureau; (2) that an appropriation of \$5,000 be asked for to run an area from the west entrance of the building southwardly to the southwest corner, thence along the south side of the

building to the southeast corner, and thence to the eastern entrance, for the purpose of securing necessary ventilation for the basement, and for the further purpose of turning the surface water from the building, instead of into the basement, where it now finds its way; and (3) an appropriation of \$2,500 is recommended for ordinary and timely repairs of the building.

EMPLOYEES.

Employees authorized by Congress in the appropriation for the maintenance of the Bureau for the fiscal year ended June 30, 1898, covering the several grades and classes, were 1,836. The Fifty-fifth Congress, in the appropriation for the fiscal year of 1899, made a reduction of 110 places in the classified service, adding 10 laborers and 5 female laborers to the force, making a net reduction of 95. The reduction was made June 30, 1898.

Up to the close of the fiscal year there had been reinstated in the service of this Bureau, under Rule 9, Civil Service, 121 ex-Union soldiers, who had formerly served in the Bureau, and 18 in the pension agencies, making 139 restored to the service. There had been made 261 promotions of ex-Union soldiers in the Bureau and 18 in the agencies. Four soldiers' widows were reinstated, 2 soldiers' widows promoted, and 58 orphans and relatives of soldiers reinstated and promoted. The Civil Service Commission has furnished 2 clerks for the Bureau and 7 for the agencies. All others were reinstatements, as set forth. During the fiscal year the Bureau has furnished by detail to other departments and bureaus, from its authorized force, employees as follows:

Department or bureau.	Number of employees.	Salaries.
Department of the Interior:		
Secretary's Office	33	\$17,163.29
Patent Office	7	4,584.46
Bureau of Education	1	1,200.00
Civil Service Commission	14	9,629.89
Navy Department	1	242.29
Executive Department	5	2,752.44
Congress	2	3,701.04
Total	a 63	39,223.41

a Part time.

During the year the office force was so organized as to devote four days per week (Mondays, Tuesdays, Wednesdays, and Thursdays) to original claims in the adjudicating divisions, and Fridays and Saturdays to increase claims, the widows' sections continuing throughout the week on widows' claims.

It will be observed that 14,881 invalid claimants filed claims for original pension and 21,412 widows filed for original pension, making a total of 36,293 claims of the war of the rebellion, or, rather, claimants, as per Table No. 11. There were 32,517 original invalid pensions

and 19,310 widows' original pensions granted, making a total of 51,827 original pensions granted. This would seemingly indicate that 51,827 claimants had been settled with. This is not exactly so, as many of these were pensioned under the act of June 27, 1890, and still have claims awaiting adjudication under the general laws.

It affords me pleasure to say that the working productive force of this Bureau has rendered good, careful, conscientious service during the year; the class of claims we have had to deal with being largely of long standing and most difficult.

Respectfully submitted.

H. CLAY EVANS,
Commissioner.

THE SECRETARY OF THE INTERIOR.



NORTH COURT OF GREAT HALL, PENSION BUILDING.



SOUTH COURT OF GREAT HALL, PENSION BUILDING.

TABLE NO. 1.—Number of pensions allowed and increased during the year, with the annual value of all pensions on the rolls.

Pensions allowed and increased during the year.											Annual value of pensions as shown by the rolls June 30, 1898.
Original.		Increase, release, and additional.		Restoration and renewal.		Dropped from the rolls.		Number of pensioners June 30, 1898.			
Number.	Annual value.	Number.	Annual value.	Number.	Annual value.	Number.	Annual value.				
Year ended June 30, 1898.											
Army, general law											
3,502	\$402,730	12,300	\$981,000	1,729	\$257,621	15,226	\$2,573,104	327,080	\$54,183,763		
37	5,439	1	.....	1	.....	46	6,946	655	97,244	
4,250	603,500	100	12,900	62	8,184	7,000	1,136,660	92,557	14,177,092		
Navy, general law											
239	38,240	192	16,128	42	6,300	236	46,964	4,833	885,687		
89	17,266	5	735	.....	.....	164	30,996	2,300	440,628	
Army, act June 27, 1890											
27,754	2,442,352	13,185	751,545	2,086	195,456	12,712	1,512,728	399,368	44,059,368		
14,545	1,471,065	164	6,560	123	14,145	7,968	868,512	119,785	12,125,324		
1,022	91,980	526	24,106	84	7,728	394	44,128	14,543	1,550,505		
406	42,224	2	144	3	432	231	27,253	5,944	605,784		
1	96	.....	.....	.....	.....	5	985	3	283	
War of 1812											
7	1,008	1	48	.....	.....	410	59,040	2,407	336,300	
War with Mexico											
46	4,508	273	19,383	8	896	964	114,716	10,012	1,158,684		
502	48,192	5	405	1	96	432	41,904	8,143	783,480		
Indian wars, 1832-1842											
17	1,632	2	192	.....	.....	371	35,987	2,019	194,640	
211	20,266	4	192	.....	.....	432	41,472	4,967	390,708	
52,648	5,190,483	26,760	1,693,423	4,089	490,858	46,651	6,541,490	993,714	130,968,465	Total	

Average annual value of each pension

Average annual value of each pension under the general law

Average annual value of each pension under the act of June 27, 1890

To the total number of pensions granted during 1898 there must be added 6,862 original and 762 restoration and renewal cases which, though allowed during 1897, were not mailed to the pension agents until after the close of that fiscal year.

\$131.79

163.21

108.11

TABLE NO. 2.—Number of pensioners of the various classes dropped from the rolls during the year, with the cause, and the number of each class on the rolls June 30, 1898.

Classes.	By death.	By remarriage.	Minors by legal limitation.	By failure to claim.	For other causes.	Total number of pensioners dropped from the rolls.	Total number of pensioners of all classes on the rolls June 30, 1898.
<i>General law.</i>							
Army and Navy.....	9,925			389	5,198	15,462	331,913
{ Invalids.....	27				19	46	655
{ Nurses.....	4,783	653	945	707	136	7,224	94,867
{ Widows, etc....							
Total.....	14,735	653	945	1,046	5,353	22,732	427,425
<i>Classification of widows' roll, general law:</i>							
Widows without children.....	2,392	291		326	76	3,085	66,325
Widows with children.....	202	356		15	20	593	10,453
Minor children.....	5		945		31	981	1,886
Mothers.....	1,730	6		295	6	2,037	13,572
Fathers.....	448			70	3	521	2,560
Brothers and sisters, dependent sons and daughters.....	6			1		7	111
<i>Act of June 27, 1890.</i>							
Army and Navy.....	11,886			834	386	13,106	413,909
{ Invalids.....	4,944	692	1,179	748	636	8,199	125,729
{ Widows, etc....							
Total.....	16,830	692	1,179	1,582	1,022	21,305	539,638
<i>Classification of widows' roll, act of June 27, 1890:</i>							
Widows without children.....	3,282	369		556	466	4,673	86,290
Widows with children.....	438	323		52	113	926	25,945
Minor children.....	16		1,179		22	1,217	4,683
Mothers.....	755			88	10	853	5,677
Fathers.....	435			52	4	491	2,624
Helpless children.....	18				21	39	510
<i>War of 1812.</i>							
Survivors.....	5					5	3
Widows.....	317			88	5	410	2,407
Total.....	322			88	5	415	2,410
<i>War with Mexico.</i>							
Survivors.....	834			90	40	964	10,012
Widows.....	337	20		62	13	432	8,143
Total.....	1,171	20		152	53	1,396	18,155
<i>Indian wars, 1832-1842.</i>							
Survivors.....	281			89	1	371	2,019
Widows.....	352	4		74	2	432	4,067
Total.....	633	4		163	3	803	6,086
Grand total.....	33,691	1,369	2,124	3,031	6,436	46,651	993,714

Total number of children on the rolls: General law, 18,091; act of June 27, 1890, 47,322. Total minors, 65,413.

TABLE NO. 3.—Showing the appropriations for pensions and the disbursements on account thereof for the fiscal year 1898, and unexpended balances at the close of the year.

Items of appropriation.	Appropriations.			Disbursements.			Balances.			
	Amount ap- propriated, act December 22, 1896.	Amount deficiency ap- propriation, act May 31, 1898.	Repay- ments to the appro- priation.	Total.	Amount dis- bursed by United States pension agents.	Amount disbursed by Treas- ury settle- ments.	Total amount disbursed.	Balance re- maining in the hands of United States pension agents June 30, 1898.	Balance re- maining in the United States Treas- ury June 30, 1898.	Available balances June 30, 1898.
Army pensions	\$133,000,000	\$8,070,872.46	\$11,876.68	\$144,082,749.14	\$140,824,029.73	\$100,318.98	\$140,924,348.71	\$1,388,035.86	\$1,770,364.57	\$3,158,400.43
Navy pensions	4,000,000	.....	143.65	4,000,143.65	3,723,932.90	3,598.19	3,727,531.09	135,040.22	137,572.94	272,612.56
Fees of examining surgeons, pensions	700,000	.....	10.55	700,010.55	670,885.67	.....	670,885.67	12,043.40	17,081.48	29,124.88
Salaries, pension agents	72,000	.....	.....	72,000.00	72,000.00	.....	72,000.00	.....	.....	.....
Clerk hire, pension agencies	430,000	.....	.30	430,000.30	416,685.68	.....	416,685.68	9,637.26	3,677.36	13,314.62
Rent, pension agencies	26,130	.....	.....	26,130.00	17,579.99	.....	17,579.99	330.51	8,219.50	8,550.01
Fuel, pension agencies	250	.....	.....	250.00	158.05	.....	158.05	20.70	71.25	91.95
Lights, pension agencies	500	.....	.....	500.00	348.95	.....	348.95	44.65	106.40	151.05
Contingent expenses, pen- sion agencies	35,000	.....	4.12	35,004.12	23,244.59	6,612.58	29,857.17	1,074.31	4,072.64	5,146.95
Total	141,263,880	8,070,872.46	12,035.30	149,346,787.76	145,748,865.56	110,529.75	145,859,395.31	1,546,226.91	1,941,165.54	3,487,392.45

In addition to the above there was disbursed during the fiscal year ended June 30, 1898, the following sum, chargeable to the appropriation for the fiscal year ended June 30, 1897: Fees of examining surgeons, pensions, \$223,363.41.

TABLE NO. 4.—Amount disbursed at United States pension agencies during the fiscal year ended June 30, 1898, as shown by accounts current.

United States pension agencies during the fiscal year ended June 30, 1898, as shown by accounts current.												
Agency.	Pensions.	Fees of examining surgeons, pensions.	Army pensions.							Navy pensions.	Grand total.	
			Salaries.	Clerk hire.	Rent.	Fuel.	Light.	Contingent expenses.	Total.			
Augusta.....	\$3,064,511.03	.....	\$4,000	\$8,553.57	.....	.....	.....	.....	\$567.74	\$3,077,632.34	.....	\$3,077,632.34
Boston.....	6,675,353.75	.....	4,000	23,180.00	.....	.....	.....	.....	1,549.07	6,704,082.82	\$827,392.41	7,531,475.23
Buffalo.....	6,639,158.26	.....	4,000	21,231.98	\$1,857.00	.....	.....	.....	1,374.96	6,667,622.20	.....	6,667,622.20
Chicago.....	10,357,770.91	.....	4,000	30,391.02	.....	.....	.....	.....	1,322.90	10,393,490.83	743,541.94	11,137,032.77
Columbus.....	15,937,991.27	.....	4,000	36,505.61	.....	.....	.....	.....	1,181.57	15,999,678.45	.....	15,999,678.45
Concord.....	3,000,437.96	.....	4,000	9,540.00	.....	.....	.....	.....	170.94	3,014,148.90	.....	3,014,148.90
Des Moines.....	8,672,064.49	.....	4,000	24,735.57	.....	.....	.....	.....	774.30	8,701,574.36	.....	8,701,574.36
Detroit.....	7,082,050.92	.....	4,000	21,204.02	2,400.00	.....	.....	.....	1,135.66	7,110,799.60	.....	7,110,799.60
Indianapolis.....	11,277,582.09	.....	4,000	31,226.85	1,833.33	278.75	.....	.....	1,251.46	11,316,172.48	.....	11,316,172.48
Knoxville.....	8,056,291.41	.....	4,000	20,279.15	.....	.....	.....	.....	1,926.24	8,082,496.80	.....	8,082,496.80
Louisville.....	4,328,240.52	.....	4,000	11,246.40	.....	.....	.....	.....	638.49	4,344,184.41	.....	4,344,184.41
Milwaukee.....	7,628,968.52	.....	4,000	19,284.56	1,916.66	.....	.....	.....	1,118.75	7,655,288.49	.....	7,655,288.49
New York.....	6,523,988.52	.....	4,000	31,537.20	5,000.00	.....	.....	.....	1,085.28	6,565,611.00	680,718.59	7,246,329.59
Philadelphia.....	7,803,948.06	.....	4,000	27,341.71	.....	.....	.....	.....	2,172.47	7,837,462.24	518,779.32	8,356,241.56
Pittsburg.....	7,022,404.00	.....	4,000	25,373.99	.....	.....	.....	.....	2,124.70	7,053,902.69	.....	7,053,902.69
San Francisco.....	3,458,333.86	.....	4,000	10,000.00	1,443.00	32.80	.....	.....	431.80	3,474,241.46	167,390.51	3,641,631.97
San Francisco.....	15,540,926.10	.....	4,000	34,785.91	1,750.00	.....	.....	.....	2,091.13	15,592,553.14	.....	15,592,553.14
Topeka.....	7,724,981.06	670,885.67	4,000	30,268.14	1,380.00	125.25	70.20	.....	2,277.13	8,433,990.45	786,110.13	9,220,100.58
Washington.....	140,824,029.73	670,885.67	72,000	416,685.68	17,579.89	158.05	348.95	.....	23,244.59	142,624,932.66	3,723,932.90	146,348,865.56
Total.....												

In addition to the above there was disbursed during the fiscal year ended June 30, 1898, the following sum, chargeable to the appropriation for the fiscal year ended June 30, 1897: Fees of examining surgeons, pensions, \$223,363.41.

PENSIONS.

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TABLE NO. 5.—*Statements of amounts paid for pensions under the general law.*

Agency.	Army Pensions.			Navy Pensions.			Grand Total.
	Invalids.	Nurses.	Widows and others.	Total.	Invalids.	Widows and others.	Total.
Augusta.....	\$1,659,823.56	\$1,540.40	\$450,800.08	\$2,112,164.04			\$2,112,164.04
Boston.....	2,303,833.31	8,181.33	1,144,290.44	3,456,305.08	\$219,116.57	\$115,920.20	\$335,036.77
Buffalo.....	3,015,740.57	2,772.00	977,331.67	3,995,844.24			3,995,844.24
Chicago.....	4,730,280.39	10,022.00	1,321,954.76	6,062,257.15	192,408.03	67,142.88	259,551.50
Columbus.....	7,015,836.50	8,292.00	1,962,722.63	8,986,851.13			8,986,851.13
Concord.....	1,657,094.99	576.00	436,234.08	2,114,905.07			2,114,905.07
Des Moines.....	4,112,995.06	9,657.60	751,989.04	4,874,642.30			4,874,642.30
Detroit.....	3,557,152.63	3,669.60	734,526.44	4,295,378.67			4,295,378.67
Indianapolis.....	6,652,345.21	3,600.00	1,468,875.04	8,124,820.25			8,124,820.25
Knoxville.....	1,671,037.63	6,493.20	758,882.51	2,436,413.34			2,436,413.34
Louisville.....	1,543,359.49	1,332.00	574,882.95	2,119,574.44			2,119,574.44
Milwaukee.....	3,562,184.43	4,790.00	762,026.54	4,329,000.97			4,329,000.97
New York.....	2,042,140.99	4,606.00	954,977.00	3,001,725.99	127,145.55	91,350.92	218,496.47
Philadelphia.....	2,361,827.80	5,082.80	976,212.41	3,343,723.01	126,376.98	74,082.21	200,459.19
Pittsburg.....	2,429,067.60	864.00	713,080.45	3,143,012.05			3,143,012.05
San Francisco.....	847,885.61	8,439.20	205,410.69	1,061,735.50	39,844.01	8,397.66	47,241.67
Topeka.....	5,345,350.55	11,446.80	1,229,478.06	6,586,284.41			6,586,284.41
Washington.....	2,097,665.44	14,632.46	838,180.62	3,850,488.52	198,235.16	131,925.30	319,560.46
Total.....	57,506,551.36	106,629.39	16,281,856.31	73,895,037.06	892,126.89	486,219.17	1,380,346.06
				73,895,037.06			75,275,383.12

TABLE NO. 6.—Statement of amount paid for pensions under the act of June 27, 1890.

Agency.	Army pensions.			Navy pensions.			Grand total.
	Invalids.	Widows and others.	Total.	Invalids.	Widows and others.	Total.	
Augusta	\$728, 973.83	\$104, 761.85	\$923, 735.68	.....	.....	.....	\$923, 735.68
Boston	2, 122, 148.04	1, 051, 461.03	3, 173, 609.07	\$340, 915.00	\$151, 440.64	\$492, 355.64	3, 665, 964.71
Buffalo	1, 985, 153.18	613, 054.71	2, 598, 207.89	.....	.....	.....	2, 598, 207.89
Chicago	3, 049, 836.82	1, 062, 643.08	4, 112, 579.90	391, 396.27	92, 594.17	483, 990.44	4, 596, 570.34
Columbus	5, 450, 023.36	1, 418, 010.53	6, 868, 033.89	.....	.....	.....	6, 868, 033.89
Concord	666, 585.80	200, 380.16	866, 965.96	.....	.....	.....	866, 965.96
Des Moines	3, 040, 856.57	673, 511.43	3, 714, 368.00	.....	.....	.....	3, 714, 368.00
Detroit	2, 203, 840.12	543, 431.93	2, 746, 772.05	.....	.....	.....	2, 746, 772.05
Indianapolis	2, 272, 901.32	763, 743.90	3, 036, 645.22	.....	.....	.....	3, 036, 645.22
Knoxville	3, 070, 691.17	1, 338, 677.13	4, 409, 568.30	.....	.....	.....	4, 409, 568.30
Louisville	1, 467, 106.23	622, 486.84	2, 089, 601.57	.....	.....	.....	2, 089, 601.57
Milwaukee	2, 628, 418.72	621, 213.89	3, 249, 632.61	.....	.....	.....	3, 249, 632.61
New York	2, 162, 639.37	1, 282, 635.69	3, 445, 275.06	290, 033.70	172, 188.42	462, 222.12	3, 907, 497.18
Philadelphia	3, 085, 489.53	1, 307, 000.71	4, 392, 490.24	203, 772.22	114, 647.91	318, 320.13	4, 710, 810.37
Pittsburg	2, 971, 967.10	875, 010.59	3, 846, 977.69	.....	.....	.....	3, 846, 977.69
San Francisco	1, 721, 437.49	393, 885.55	2, 115, 323.04	102, 062.96	18, 085.88	120, 148.84	2, 235, 471.88
Topeka	6, 820, 790.65	1, 831, 708.80	8, 652, 499.45	.....	.....	.....	8, 652, 499.45
Washington	2, 819, 498.19	850, 298.02	3, 669, 796.21	351, 082.08	115, 467.59	466, 549.67	4, 136, 345.88
Total	48, 267, 959.49	15, 644, 124.34	63, 912, 083.83	1, 679, 262.23	604, 324.61	2, 343, 586.84	66, 255, 670.67

TABLE NO. 7.—Statement showing amounts paid for pensions to the survivors and widows of the war of 1812, since 1871; of the war with Mexico, since 1887, and of the Indian wars, since 1893.

Fiscal year.	War of 1812.			War with Mexico.			Indian wars, 1803-1842.		
	Survivors.	Widows.	Total disbursements.	Survivors.	Widows.	Total disbursements.	Survivors.	Widows.	Total disbursements.
1871 (from February 14, 1871).....	\$2,555.05	\$511.00	3,066.05						
1872.....	1,977,415.84	335,993.63	2,313,409.47						
1873.....	2,078,006.98	689,303.59	2,767,310.57						
1874.....	1,588,832.95	610,010.40	2,204,849.35						
1875.....	1,355,599.86	533,000.21	1,888,600.07						
1876.....	1,089,037.18	445,772.95	1,534,810.13						
1877.....	914,057.82	301,548.91	1,206,206.73						
1878 (from March 9, 1878).....	768,918.47	294,572.05	1,063,490.52						
1879.....	1,014,525.60	2,192,699.54	3,207,225.20						
1880.....	790,710.30	2,658,058.14	3,448,768.53						
1881.....	621,512.80	2,381,800.95	3,003,313.75						
1882.....	378,274.85	2,024,207.63	2,502,482.48						
1883.....	275,584.51	1,882,542.41	2,258,977.32						
1884.....	275,584.51	1,666,302.09	1,965,190.94						
1885.....	207,782.80	1,318,502.39	1,725,985.19						
1886.....	144,389.59	1,745,582.44	1,963,296.08						
1887.....	108,877.01	1,708,582.44	1,871,419.37	50,148.69	2,438.08	55,606.76			
1888.....	78,650.18	1,596,404.90	1,675,055.08	1,861,768.07	583,056.28	2,444,812.35			
1889.....	58,800.37	1,307,487.09	1,366,287.46	1,738,899.30	603,572.45	2,400,471.75			
1890.....	38,847.69	1,293,239.37	1,332,087.06	1,728,027.54	606,054.90	2,423,082.44			
1891.....	28,547.64	1,040,284.41	1,068,832.05	1,622,318.75	606,814.52	2,317,439.27			
1892.....	11,068.93	827,080.53	838,149.46	1,435,258.18	606,738.97	2,111,991.75			
1893.....	10,494.37	721,080.32	731,574.69	1,394,342.38	736,173.41	2,132,565.79	184,076.26	66,434.05	224,510.31
1894.....	5,312.30	645,297.46	650,609.76	1,388,707.07	808,345.91	2,192,052.98	577,683.57	450,652.25	834,535.82
1895.....	3,583.37	541,823.48	545,406.85	1,433,694.86	802,032.94	2,235,723.82	808,305.24	460,161.39	777,526.63
1896.....	1,972.37	456,847.61	458,819.98	1,266,083.95	814,046.14	2,162,782.09	808,778.30	468,694.44	737,472.74
1897.....	1,440.00	388,201.95	389,731.95	1,379,583.31	814,046.14	2,097,752.09	227,580.41	442,082.76	690,663.17
1898.....	791.06	347,070.15	347,861.21	1,213,504.63	840,560.26	2,000,068.89	189,981.39	418,907.35	608,978.74
Total.....	14,018,294.39	30,070,198.02	44,088,492.41	16,567,377.72	8,178,962.38	24,744,839.86	1,539,605.17	2,322,022.24	3,862,627.41

TABLE NO. 6.—Statement of amount paid for pensions under the act of June 27, 1890.

Agency.	Army pensions.			Navy pensions.			Grand total.
	Invalids.	Widows and others.	Total.	Invalids.	Widows and others.	Total.	
Angusta	\$728, 973.83	\$104, 761.85	\$823, 735.68	.....	.....	.....	\$823, 735.68
Boston	2, 122, 148.04	1, 051, 461.03	3, 173, 609.07	\$340, 915.00	\$151, 440.64	\$492, 355.64	3, 665, 964.71
Buffalo	1, 985, 155.18	613, 054.71	2, 598, 209.89	.....	.....	.....	2, 598, 209.89
Chicago	3, 049, 936.82	1, 082, 643.08	4, 112, 579.90	391, 396.27	92, 594.17	483, 990.44	4, 596, 570.34
Columbus	5, 450, 023.36	1, 418, 010.53	6, 868, 033.89	.....	.....	.....	6, 868, 033.89
Concord	666, 585.80	290, 380.16	956, 965.96	.....	.....	.....	956, 965.96
Des Moines	3, 040, 856.57	673, 511.43	3, 714, 368.00	.....	.....	.....	3, 714, 368.00
Detroit	2, 203, 340.12	543, 431.93	2, 746, 772.05	.....	.....	.....	2, 746, 772.05
Indianapolis	2, 272, 901.32	763, 743.90	3, 036, 645.22	.....	.....	.....	3, 036, 645.22
Knoxville	3, 070, 691.17	1, 338, 877.13	4, 409, 568.30	.....	.....	.....	4, 409, 568.30
Louisville	1, 467, 106.23	622, 495.34	2, 089, 601.57	.....	.....	.....	2, 089, 601.57
Milwaukee	2, 638, 418.72	621, 213.89	3, 249, 632.61	.....	.....	.....	3, 249, 632.61
New York	2, 162, 639.37	1, 282, 635.69	3, 445, 275.06	290, 083.70	172, 186.42	462, 270.12	3, 907, 497.18
Philadelphia	3, 085, 489.53	1, 307, 000.71	4, 392, 490.24	203, 772.22	114, 547.91	318, 320.13	4, 710, 810.37
Pittsburg	2, 971, 967.10	875, 010.59	3, 846, 977.69	.....	.....	.....	3, 846, 977.69
San Francisco	1, 721, 427.49	393, 885.55	2, 115, 313.04	102, 062.96	18, 085.88	120, 148.84	2, 235, 471.88
Topeka	6, 820, 790.65	1, 831, 708.80	8, 652, 499.45	.....	.....	.....	8, 652, 499.45
Washington	2, 819, 498.19	850, 298.02	3, 669, 796.21	351, 082.08	115, 467.59	466, 549.67	4, 136, 345.88
Total	48, 267, 969.49	15, 644, 124.34	63, 912, 093.83	1, 679, 262.23	664, 324.61	2, 343, 586.84	66, 255, 670.67

TABLE No. 7.—Statement showing amounts paid for pensions to the survivors and widows of the war of 1812, since 1871; of the war with Mexico, since 1857, and of the Indian wars, since 1853.

Fiscal year.	War of 1812.			War with Mexico.			Indian wars, 1853-1842.		
	Survivors.	Widows.	Total disbursements.	Survivors.	Widows.	Total disbursements.	Survivors.	Widows.	Total disbursements.
1871 (from February 14, 1871)	\$2,555.05	\$511.00	\$3,066.05						
1872	1,977,415.84	335,993.63	2,313,409.47						
1873	2,078,606.58	689,303.59	2,767,910.17						
1874	1,888,832.95	616,016.40	2,504,849.35						
1875	1,355,890.56	533,090.21	1,888,980.77						
1876	1,089,037.18	445,772.93	1,534,810.13						
1877	914,657.52	361,548.91	1,276,206.43						
1878 (from March 9, 1878)	768,918.47	294,572.05	1,063,490.52						
1879	1,014,525.66	2,192,699.54	3,207,225.20						
1880	790,710.39	2,658,058.14	3,448,768.53						
1881	621,612.80	2,381,800.95	3,003,413.75						
1882	478,274.85	2,024,207.63	2,502,482.48						
1883	357,234.81	1,882,542.41	2,239,777.22						
1884	278,888.85	1,686,302.09	1,965,190.94						
1885	207,782.80	1,518,202.39	1,725,985.19						
1886	144,389.59	1,408,896.44	1,553,286.03						
1887	106,837.01	1,705,582.36	1,812,419.37	53,148.69	2,458.08	56,606.76			
1888	73,659.48	1,596,604.96	1,670,264.44	1,861,756.07	583,056.28	2,444,812.35			
1889	52,800.27	1,397,487.09	1,450,287.36	1,746,893.20	683,572.45	2,430,471.75			
1890	38,847.09	1,263,239.37	1,302,086.46	1,728,027.84	683,054.90	2,411,082.74			
1891	22,504.64	1,040,284.41	1,062,789.05	1,622,143.18	686,314.53	2,308,457.71			
1892	11,908.93	827,080.52	838,989.45	1,425,268.18	686,732.97	2,111,991.75			
1893	10,494.27	721,060.32	731,554.59	1,396,322.38	736,173.41	2,132,505.79	184,076.26	66,434.05	250,510.31
1894	6,312.20	645,297.46	651,609.66	1,388,707.07	608,343.91	1,997,050.98	577,883.57	456,682.25	1,034,565.82
1895	3,683.27	541,923.48	545,606.75	1,433,084.86	602,032.96	2,035,117.82	308,365.24	489,161.39	797,526.63
1896	1,972.27	466,847.61	468,819.88	1,368,083.80	814,066.14	2,182,150.00	268,778.30	488,694.44	757,472.74
1897	1,440.00	388,291.95	389,731.95	1,274,168.81	81,563.78	2,097,752.09	237,580.41	442,082.76	680,663.17
1898	791.06	347,070.15	347,861.21	1,213,504.63	846,060.26	2,060,064.89	189,981.39	418,997.35	608,978.74
Total	14,018,294.39	30,070,198.02	44,088,492.41	16,567,377.72	8,176,962.36	24,744,339.96	1,530,685.17	2,322,022.24	3,852,667.41

TABLE No. 10.—Statement showing disbursements for pensions, fees of examining surgeons, cost of disbursement, salaries, and other expenses of the Pension Bureau, and number of pensioners on rolls each fiscal year since July 1, 1865.

Fiscal year.	Disbursements for pensions.		Fees of examining surgeons.		Cost of disbursement, maintaining pension agencies, etc.	Pension Bureau.		Number of pensioners on rolls.
	Army.	Navy.	Army.	Navy.		Salaries.	Other expenses.	
1865	\$15,158,598.64	\$231,951.24			a \$155,000.00	\$237,185.00	\$15,000.00	128,722
1866	20,552,946.47	231,841.22			a 155,000.00	308,361.49	27,615.96	135,474
1867	22,811,163.75	290,325.61			a 155,000.00	308,158.20	31,834.14	166,643
1868	28,108,323.84	308,923.93			216,212.86	366,007.31	43,519.50	187,963
1869	29,043,237.00	308,251.78			431,720.03	353,660.00	51,125.00	196,686
1870	28,081,542.41	437,250.21			457,379.51	372,378.97	58,960.00	207,496
1871	29,276,921.02	475,825.79			456,823.99	436,316.71	57,397.78	232,169
1872	28,502,528.96	478,534.93			447,683.17	446,021.26	90,855.39	236,411
1873	28,603,156.24	603,619.75			444,074.79	444,062.24	73,943.72	236,241
1874	28,727,104.76	643,300.00			447,702.13	468,577.80	73,768.35	234,621
1875	27,411,366.53	923,900.00			435,270.05	443,262.06	84,786.88	232,137
1876	27,696,461.72	934,283.53			313,194.37	443,096.56	67,102.78	232,104
1877	26,251,725.91	955,098.00			203,851.24	453,255.70	64,088.70	222,998
1878	33,109,339.92	787,568.06			231,923.76	452,517.94	53,033.08	242,735
1879	36,901,670.42	1,031,500.00			222,256.90	468,165.45	44,632.19	268,800
1880	49,419,965.35	884,860.00			285,630.29	988,165.45	130,981.85	338,849
1881	53,328,192.05	936,963.11			275,976.93	1,723,285.08	353,322.42	303,556
1882	59,468,610.70	807,272.23			216,000.00	1,656,093.54	511,492.12	345,132
1883	66,945,115.23	476,631.73			16,100.00	1,822,393.90	498,791.91	368,765
1884	64,232,275.84	649,601.78			10,000.00	1,868,560.86	498,791.91	368,765
1885	72,034,642.90	1,938,500.36			248,280.42	1,098,097.85	429,778.24	452,577
1886	77,454,756.97	1,257,710.26			273,109.50	1,078,116.36	429,778.24	452,577
1887	88,896,562.15	1,257,710.26			392,360.13	2,301,725.90	370,540.73	537,180
1888	98,969,562.15	2,595,036.67			517,392.05	2,460,122.87	370,540.73	537,180
1889	103,896,562.15	2,595,036.67			517,392.05	2,460,122.87	370,540.73	537,180
1890	114,744,611.04	3,473,535.35			517,392.05	2,460,122.87	370,540.73	537,180
1891	133,314,611.04	3,473,535.35			517,392.05	2,460,122.87	370,540.73	537,180
1892	133,314,611.04	3,473,535.35			517,392.05	2,460,122.87	370,540.73	537,180
1893	133,314,611.04	3,473,535.35			517,392.05	2,460,122.87	370,540.73	537,180
1894	133,314,611.04	3,473,535.35			517,392.05	2,460,122.87	370,540.73	537,180
1895	133,314,611.04	3,473,535.35			517,392.05	2,460,122.87	370,540.73	537,180
1896	133,314,611.04	3,473,535.35			517,392.05	2,460,122.87	370,540.73	537,180
1897	133,314,611.04	3,473,535.35			517,392.05	2,460,122.87	370,540.73	537,180
1898	140,924,548.71	3,727,531.09			517,392.05	2,460,122.87	370,540.73	537,180
Total	2,203,888,611.90	47,667,309.88	14,466,516.86	308,273.11	11,569,662.14	42,290,531.90	7,329,310.04	.....

b Now included in Army.

a Approximate.

1861.

TABLE NO. 11.—OF APPLICATIONS FILED AND TOTAL NUMBER OF CLAIMANTS ALLOWED.																				
Final year ending June 30—	General law.				Army and navy claims allowed.		Claims allowed.		Applications filed.		Applications allowed.		Applications filed.		Claims allowed.		Applications filed.		Total number of applications filed.	Total number of pensioners allowed.
	Invalids.	Survivors, etc.	Invalids.	Survivors, etc.	Invalids.	Survivors, etc.	Invalids.	Survivors, etc.	Invalids.	Survivors, etc.	Invalids.	Survivors, etc.	Invalids.	Survivors, etc.	Invalids.	Survivors, etc.	Invalids.	Survivors, etc.		
1862.....	1,362	1,000	65	413	49	413	3,763	49	413	3,763	49	413	3,763	49	413	3,763	49	413	462	7,884
1863.....	26,380	22,377	290	4,121	3,746	4,121	3,746	324	4,121	3,746	4,121	3,746	324	4,121	3,746	4,121	3,746	324	40,332	30,487
1864.....	20,263	32,627	385	17,041	24,446	17,041	24,446	466	15,212	24,959	15,212	24,959	466	15,212	24,959	15,212	24,959	466	72,684	40,171
1865.....	27,299	44,464	455	15,212	24,959	15,212	24,959	466	15,212	24,959	15,212	24,959	466	15,212	24,959	15,212	24,959	466	65,256	50,177
1866.....	35,799	28,732	350	22,883	27,294	22,883	27,294	375	22,883	27,294	22,883	27,294	375	22,883	27,294	22,883	27,294	375	36,452	30,753
1867.....	15,905	20,295	250	16,589	19,883	16,589	19,883	333	16,589	19,883	16,589	19,883	333	16,589	19,883	16,589	19,883	333	20,768	28,921
1868.....	7,292	13,089	170	9,400	19,401	9,400	19,401	207	9,400	19,401	9,400	19,401	207	9,400	19,401	9,400	19,401	207	26,060	23,190
1869.....	11,035	14,496	290	7,292	15,904	7,292	15,904	245	7,292	15,904	7,292	15,904	245	7,292	15,904	7,292	15,904	245	24,851	18,221
1870.....	12,091	11,400	260	5,721	12,500	5,721	12,500	200	5,721	12,500	5,721	12,500	200	5,721	12,500	5,721	12,500	200	43,909	16,562
1871.....	8,837	9,985	190	7,934	8,399	7,934	8,399	143	7,934	8,399	7,934	8,399	143	7,934	8,399	7,934	8,399	143	26,301	34,333
1872.....	8,857	6,755	240	6,408	7,244	6,408	7,244	178	6,408	7,244	6,408	7,244	178	6,408	7,244	6,408	7,244	178	18,303	16,052
1873.....	8,728	6,437	248	6,551	4,073	6,551	4,073	120	6,551	4,073	6,551	4,073	120	6,551	4,073	6,551	4,073	120	16,734	10,402
1874.....	9,302	5,693	228	5,937	3,152	5,937	3,152	151	5,937	3,152	5,937	3,152	151	5,937	3,152	5,937	3,152	151	18,704	11,153
1875.....	11,926	5,294	310	5,700	4,736	5,700	4,736	178	5,700	4,736	5,700	4,736	178	5,700	4,736	5,700	4,736	178	23,523	9,977
1876.....	17,090	5,264	344	5,360	4,376	5,360	4,376	130	5,360	4,376	5,360	4,376	130	5,360	4,376	5,360	4,376	130	22,715	11,963
1877.....	16,532	5,269	371	7,252	3,861	7,252	3,861	197	7,252	3,861	7,252	3,861	197	7,252	3,861	7,252	3,861	197	44,587	19,546
1878.....	18,812	6,061	300	7,414	3,550	7,414	3,550	131	7,414	3,550	7,414	3,550	131	7,414	3,550	7,414	3,550	131	31,334	19,545
1879.....	36,835	9,767	309	17,252	3,379	17,252	3,379	215	17,252	3,379	17,252	3,379	215	17,252	3,379	17,252	3,379	215	57,118	31,316
1880.....	110,073	25,062	1,361	10,576	4,455	10,576	4,455	559	10,576	4,455	10,576	4,455	559	10,576	4,455	10,576	4,455	559	141,466	27,664
1881.....	18,455	10,327	515	21,394	3,920	21,394	3,920	225	21,394	3,920	21,394	3,920	225	21,394	3,920	21,394	3,920	225	38,102	34,193
1882.....	29,004	10,319	472	22,916	3,969	22,916	3,969	211	22,916	3,969	22,916	3,969	211	22,916	3,969	22,916	3,969	211	48,776	35,767
1883.....	35,039	11,878	577	22,014	5,303	22,014	5,303	251	22,014	5,303	22,014	5,303	251	22,014	5,303	22,014	5,303	251	49,895	40,857
1884.....	28,962	11,259	724	27,414	6,366	27,414	6,366	277	27,414	6,366	27,414	6,366	277	27,414	6,366	27,414	6,366	277	72,465	55,193
1885.....	27,959	11,557	725	27,580	7,743	27,580	7,743	263	27,580	7,743	27,580	7,743	263	27,580	7,743	27,580	7,743	263	75,752	59,252
1886.....	35,202	13,238	866	33,283	8,919	33,283	8,919	338	33,283	8,919	33,283	8,919	338	33,283	8,919	33,283	8,919	338	90,487	65,194
1887.....	36,484	15,759	866	33,283	11,217	33,283	11,217	338	33,283	11,217	33,283	11,217	338	33,283	11,217	33,283	11,217	338	105,444	83,716
1888.....	47,505	18,444	1,251	33,843	10,816	33,843	10,816	427	33,843	10,816	33,843	10,816	427	33,843	10,816	33,843	10,816	427	136,456	106,337
1889.....	52,152	23,597	1,312	36,830	11,924	36,830	11,924	579	36,830	11,924	36,830	11,924	579	36,830	11,924	36,830	11,924	579	165,447	121,630
1890.....	71,570	28,305	2,162	50,395	14,658	50,395	14,658	788	50,395	14,658	50,395	14,658	788	50,395	14,658	50,395	14,658	788	224,447	131,630
1891.....	20,519	17,521	590	41,381	11,914	41,381	11,914	404	41,381	11,914	41,381	11,914	404	41,381	11,914	41,381	11,914	404	205,440	119,301
1892.....	17,432	15,765	742	17,876	7,287	17,876	7,287	404	17,876	7,287	17,876	7,287	404	17,876	7,287	17,876	7,287	404	177,702	90,148
1893.....	9,213	12,000	654	10,252	7,225	10,252	7,225	358	10,252	7,225	10,252	7,225	358	10,252	7,225	10,252	7,225	358	97,060	39,185
1894.....	6,053	8,551	690	6,129	3,627	6,129	3,627	237	6,129	3,627	6,129	3,627	237	6,129	3,627	6,129	3,627	237	62,922	40,874
1895.....	4,280	7,326	370	5,415	3,912	5,415	3,912	246	5,415	3,912	5,415	3,912	246	5,415	3,912	5,415	3,912	246	48,408	50,101
1896.....	1,862	6,101	420	3,864	3,912	3,864	3,912	264	3,864	3,912	3,864	3,912	264	3,864	3,912	3,864	3,912	264	37,524	52,648
1897.....	2,378	6,630	558	3,726	4,612	3,726	4,612	297	3,726	4,612	3,726	4,612	297	3,726	4,612	3,726	4,612	297	33,749	40,874
1898.....	2,217	7,016	607	3,741	4,339	3,741	4,339	315	3,741	4,339	3,741	4,339	315	3,741	4,339	3,741	4,339	315	39,847	50,101
Total ..	852,144	510,000	21,599	10,687	522,856	325,261	490,371	203,718	411,661	156,989	34,943	45,236	23,713	35,474	25,051	14,747	20,551	11,166	2,292,940	1,579,324

Beginning with the year 1893 the total number of applications filed and the total number of claimants allowed include army nurses and widows of Indian wars. The applications and allowances in 1893 have been as follows: Claims of nurses filed, 75; allowed, 37. Claims of survivors of Indian wars filed, 47; allowed, 17. Claims of widows of Indian wars filed, 296; allowed 511.

1899.....

Beginning with the year 1893 the total number of applications filed and the total number of claims allowed include army nurses and survivors and widows of Indian wars. The applications and allowances in 1893 have been as follows: Claims of nurses filed, 97; allowed, 37. Claims of survivors of Indian wars filed, 47; allowed, 17. Claims of widows of Indian wars filed, 296; allowed, 211.

TABLE NO. 12.—Statement showing the number of pensioners in each State and Territory of the United States and in each foreign country on the rolls June 30, 1898, and the amount paid for pensions during the fiscal year 1898 in each State and Territory, and each foreign country.

	Number.	Amount.		Number.	Amount.
UNITED STATES.			FOREIGN COUNTRIES— continued.		
Alabama.....	3, 780	\$505, 098. 27	Brazil.....	6	\$1, 841. 73
Alaska.....	65	8, 970. 14	British Guiana.....	1	6 00
Arizona.....	619	87, 895. 31	Bulgaria.....	1	800. 00
Arkansas.....	10, 949	1, 521, 527. 82	Canada.....	2, 192	832, 088. 47
California.....	16, 981	2, 442, 231. 65	Chile.....	10	966. 53
Colorado.....	7, 307	1, 001, 617. 20	China.....	16	3, 188. 83
Connecticut.....	12, 015	1, 410, 115. 59	Comora Islands.....	1	180. 00
Delaware.....	2, 740	419, 917. 57	Costa Rica.....	3	468. 00
District of Columbia.....	8, 629	1, 532, 120. 97	Cuba.....	4	405. 00
Florida.....	3, 121	426, 058. 07	Cyprus.....	2	165. 87
Georgia.....	3, 770	495, 737. 07	Danish West Indies.....	2	480. 00
Idaho.....	1, 248	177, 287. 17	Denmark.....	23	3, 484. 50
Illinois.....	70, 787	10, 371, 293. 73	Dutch East Indies.....	1	330. 00
Indiana.....	67, 139	10, 962, 433. 06	Dutch West Indies.....	2	338. 00
Indian Territory.....	2, 682	369, 728. 01	Ecuador.....	3	48, 479. 25
Iowa.....	37, 977	5, 549, 978. 61	England.....	320	120. 00
Kansas.....	41, 629	6, 472, 964. 49	Egypt.....	1	180. 00
Kentucky.....	28, 980	4, 369, 049. 75	Finland.....	62	9, 392. 75
Louisiana.....	5, 285	868, 234. 65	France.....	632	95, 748. 45
Maine.....	20, 935	3, 127, 655. 53	Greece.....	5	732. 00
Maryland.....	12, 905	1, 789, 363. 91	Guatemala.....	4	540. 00
Massachusetts.....	38, 692	5, 804, 197. 45	Hawaii.....	29	4, 393. 50
Michigan.....	46, 436	7, 209, 436. 93	Honduras.....	7	763. 00
Minnesota.....	16, 650	2, 420, 956. 67	India.....	2	872. 00
Mississippi.....	4, 122	555, 126. 80	Ireland.....	428	64, 842. 75
Missouri.....	53, 949	7, 456, 681. 72	Ile of Man.....	34	5, 151. 00
Montana.....	1, 692	203, 951. 89	Italy.....	12	2, 195. 70
Nebraska.....	17, 627	2, 764, 084. 78	Japan.....	1	860. 00
Nevada.....	9, 204	37, 292. 73	Korea.....	6	639. 00
New Hampshire.....	20, 775	1, 362, 089. 09	Madeira.....	4	552. 00
New Jersey.....	1, 483	2, 555, 095. 89	Malta.....	2	288. 00
New Mexico.....	89, 051	219, 114. 38	Mauritius.....	112	16, 968. 25
New York.....	4, 064	12, 619, 366. 22	Mexico.....	10	2, 607. 20
North Carolina.....	1, 789	561, 292. 50	Netherlands.....	8	978. 00
North Dakota.....	105, 864	232, 030. 93	New Zealand.....	2	1, 084. 47
Ohio.....	6, 627	16, 166, 264. 16	Nicaragua.....	40	10, 259. 53
Oklahoma.....	4, 932	933, 787. 91	Norway.....	1	907. 73
Oregon.....	104, 376	712, 008. 86	Paraguay.....	7	1, 084. 80
Pennsylvania.....	4, 402	13, 164, 211. 79	Peru.....	7	1, 362. 00
Rhode Island.....	1, 743	519, 129. 51	Portugal.....	4	690. 75
South Carolina.....	4, 842	227, 332. 94	Russia.....	1	552. 00
South Dakota.....	18, 434	638, 856. 04	San Salvador.....	84	12, 726. 00
Tennessee.....	8, 000	2, 732, 349. 25	Seychelles Islands.....	2	824. 00
Texas.....	9, 635	1, 042, 628. 40	Siam.....	2	468. 00
Utah.....	8, 797	115, 171. 58	South African Republic.....	3	576. 00
Vermont.....	5, 336	1, 504, 170. 78	Spain.....	7	1, 069. 50
Virginia.....	12, 953	1, 352, 384. 37	St. Helena.....	45	144. 00
Washington.....	28, 197	780, 977. 54	Sweden.....	74	6, 817. 50
West Virginia.....	1, 099. 33	2, 058, 753. 48	Switzerland.....	2	11, 211. 00
Wisconsin.....	1	4, 308, 186. 05	Tahiti.....	7	232. 50
Wyoming.....	708	104, 818. 03	Turkey.....	3	1, 007. 00
Total in States and Territories.....	989, 343	143, 982, 017. 24	United States of Colombia.....	3	144. 00
FOREIGN COUNTRIES.			Uruguay.....	3	546. 00
Austria-Hungary.....	27	4, 090. 15	Wales.....	13	1, 834. 20
Algiers.....	2	540. 00	West Indies.....	14	2, 130. 00
Argentine Republic.....	4	487. 20			
Australia.....	39	5, 908. 85			
Azores Islands.....	1	164. 40			
Bahamas.....	2	240. 00			
Belgium.....	15	2, 272. 50			
Bermuda.....	8	1, 099. 33			
Bolivia.....	1	521. 47			
			Total in foreign countries.....	4, 871	669, 862. 56
			Grand total.....	993, 714	144, 651, 879. 80

TABLE NO. 13.—Statement showing, by classes, the different monthly rates paid to pensioners and the number at each rate on the rolls June 30, 1898.

Rate.	General law.						Rate.	General law.					
	Invalids.			Widows, etc.				Invalids.			Widows, etc.		
	Army.	Navy.	Total.	Army.	Navy.	Total.		Army.	Navy.	Total.	Army.	Navy.	Total.
\$2.00	6	1	7				\$22.00	2,811	78	2,889			
4.00	5	2	7				22.25	1	1				
5.00		2	2				22.50	75	6	81			
6.00	67,312	1,033	68,345				23.00	1	9	10			
6.25	19	2	21				23.25	3		3			
6.37 1/2	3		3				23.50		6	6			
6.75	1		1				24.00	21,610	265	21,875	11		11
7.00	62	2	64				24.50	1	3	4			
7.23 1/2	1		1				24.75	1		1			
7.50	321	8	329				25.00	2,590	78	2,668	743	131	874
7.75	7		7				25.25		1	1			
8.00	51,305	733	52,038	1,077	31	1,108	25.50	1		1			
8.12 1/2	1		1				25.75		4	4			
8.25	11		11				26.00		2	2			
8.37 1/2	1		1				26.25	3		3			
8.50	445	1	446	1		1	26.50		2	2			
8.62 1/2	1		1				26.75	1		1			
8.75	4		4				27.00	896	25	923			
9.00	361		361				27.50	8	3	11			
9.25	9		9				27.75		1	1			
9.50	10	5	15				28.00		2	2			
9.75	3	1	4				28.50		1	1			
10.00	29,483	468	29,951	5	2	7	28.75	1		1			
10.20	1		1				29.00		6	6			
10.25	10	1	11				30.00	15,438	253	15,691	679	207	886
10.50	8	7	15				30.75		1	1			
10.62 1/2	1		1				31.00		3	3			
10.75	1	3	4				31.25	26		26			
11.00	62	4	66				32.00		1	1	1		1
11.25	196	6	202				32.50		4	4			
11.37 1/2	1		1				33.00	1		1			
11.50	17	4	21				33.50		2	2			
11.75	12	3	15				34.00		1	1			
12.00	47,103	554	47,657	83,172	1,596	84,768	34.50		1	1			
12.25	12		12				35.00	7	4	11	3	2	5
12.50	110	22	132				35.50		2	2			
12.75	313	1	314				36.00	2,742	42	2,784			
13.00	431	8	439				36.50		4	4			
13.25	8	4	12				36.75		1	1			
13.37 1/2	4		4				37.00		2	2			
13.50	22	1	23				37.50		4	4	1		1
13.75	10	2	12				40.00	57	1	58	14	3	17
14.00	21,607	210	21,817	4		4	40.25		1	1			
14.25	16	1	17				41.00		2	2			
14.50	6	6	12				42.00				1		1
14.75	6		6				42.50		1	1			
15.00	2,523	89	2,612	1,457	115	1,572	43.00		1	1			
15.25	1		1				43.50		1	1			
15.50	6	3	9				45.00	2,239	18	2,257	2		2
16.00	14,250	189	14,439	1	1	2	46.00		1	1			
16.25	8	1	9				46.50		1	1			
16.50	15	6	21				48.00	1		1			
16.75	17		17				49.00	2		2			
17.00	33,110	332	33,442	2,515	7	2,522	50.00	965	22	987	97	51	148
17.25	2	1	3				53.00	1		1			
17.50	16	21	37				55.00	1		1			
17.75	3		3				57.00	1		1			
18.00	976	22	998	61	1	62	58.00		1	1			
18.25		5	5				60.00	11		11			
18.50	14	3	17				63.50		1	1			
18.75	93	1	94				72.00	2,404	75	2,479		1	1
19.00	12	5	17				75.00	4		4	8		8
19.25	5		5				82.50		1	1			
19.50		6	6				100.00	21	8	24	18	2	20
20.00	4,750	129	4,888	2,679	150	2,829	166.66 2/3				4		4
20.50	2	8	10				208.33 1/3				1		1
21.00	1	7	8				416.66 2/3				2		2
21.25	8	8	11										
21.50	1	3	4				Total	327,080	4,833	331,913	92,557	2,300	94,857

TABLE No. 13.—Statement showing, by classes, the different monthly rates paid to pensioners and the number at each rate on the rolls June 30, 1898—Continued.

Rate.	Act of June 27, 1890.								
	Invalids.			Widows, etc.					
	Army.	Navy.	Total.	Army.	Navy.	Total.			
\$6.00.....	100,151	4,271	104,422						
7.00.....	4		4						
8.00.....	119,289	4,555	123,824	111,333	5,797	117,130			
10.00.....	21,388	877	22,265	5	2	7			
11.50.....		1	1						
12.00.....	158,564	4,813	163,367	8,434	145	8,579			
13.00.....		1	1						
14.00.....				1		1			
15.00.....		5	5	2		2			
17.00.....				8		8			
17.75.....		1	1						
18.00.....		1	1						
19.75.....		1	1						
20.00.....				5		5			
20.50.....		2	2						
22.00.....		2	2						
22.50.....		1	1						
22.75.....		1	1						
24.50.....		3	3						
25.00.....				2		2			
25.50.....		1	1						
27.00.....		2	2						
28.00.....		2	2						
29.00.....		1	1						
41.00.....		1	1						
52.50.....		1	1						
Total.....	399,366	14,543	413,909	119,785	5,944	125,729			

Rate.	War of 1812.			War with Mexico.			Indian wars, 1832-1842.			Army nurses.
	Surviv- ors.	Widows.	Total.	Surviv- ors.	Widows.	Total.	Surviv- ors.	Widows.	Total.	
\$8.00.....	3	3	6	5,653	8,128	13,781	2,010	4,062	6,072	1
12.00.....		2,394	2,394	4,308	8	4,316	5	4	9	632
15.00.....				3	1	4		1	1	
16.00.....		2	2	3		3				1
18.00.....		1	1							
20.00.....		4	4	23	2	25	4		4	5
24.00.....				2		2				1
25.00.....		2	2	10	1	11				15
30.00.....				7	3	10				
40.00.....				1		1				
50.00.....		1	1	1		1				
72.00.....				1		1				
Total.....	3	2,407	2,410	10,012	8,143	18,155	2,019	4,067	6,086	655

The rates reported in this table at less than \$6 per month have been allowed for periods prior to the passage of the act of March 2, 1895, which increased all such pensions to \$6 per month, or they refer to those navy-service allowances the rates of which are fixed by the Navy Department. The rates reported in invalid cases under the act of June 27, 1890, in excess of \$12 per month refer to cases in which naval-service allowances have been granted by the Navy Department in addition to the pensions granted under said act. (See explanation naval service pension law, page 86.)

TABLE NO. 14.—Names of surviving widows and daughters of revolutionary soldiers on the pension rolls June 30, 1898, with their ages and places of residence.

Name.	Age.	Name of soldier.	Service.	Town.	State.
Barrett, Hannah Newell ¹	98	Harrod, Noah	Massachusetts.	Boston	Massachusetts.
Chadwick, Susannah ¹	83	Chadwick, Elihu ..	New Jersey	Emporium	Pennsylvania.
Damon, Esther S.	84	Damon, Noah	Massachusetts.	Plymouth Union	Vermont.
Huriburt, Sarah C ¹	80	Weeks, Elijah	do	Little Marsh	Pennsylvania.
James, Nancy	84	Darling, James	North Carolina	Jonesboro	Tennessee.
Mayo, Rebecca	85	Mayo, Stephen	Virginia	Newbern	Virginia.
Sandford, Eliza ¹	88	Sandford, William ..	United States ..	Bloomfield	New Jersey.
Slaughter, Ann M ¹	88	Slaughter, Philip ..	Virginia	Mitchell Station	Virginia.
Snead, Mary	82	Snead, Bowdoin	do	Parkalee	Do.
Thompson, Rhoda Augusta ¹	77	Thompson, Thaddeus.	New York	Woodbury	Connecticut.
Tuller, Augusta ¹	88	Way, Isaac	Connecticut	Bridgeport	Do.
Weatherman, Nancy A.		Glascok, Robert ..	Virginia	Elk Mills	Tennessee.

¹ Daughter; pensioned by special act.

TABLE NO. 15.—Names of the three surviving soldiers of the war of 1812 on the pension rolls June 30, 1898, with their ages and residences at that date.

Name.	Age.	Service (troops).	Town.	State.
Cronk, Hiram	98	New York	North Western	New York.
Glenn, Elijah	102	Maryland	Newark	New Jersey.
Smith, Eleazar	102	New Hampshire	Danbury	New Hampshire.

TABLE NO. 16.—*Report of pension certificates*

	General law.										Other laws.							
	Originals.				Increases.	Reissues.	Restorations and renews.	Duplicates.	Accrued pension.	Total under general law.	War of 1812.		Indian wars.		Old wars.		Mexican war.	
	Army invalids.	Army widows.	Navy invalids.	Navy widows.							Survivors.	Widows.	Survivors.	Widows.	Invalids.	Widows.	Survivors.	Widows.
1897.																		
July	349	375	20	10	723	262	201	58	505	2,503	..	1	1	12	...	1	15	48
August	336	429	28	4	857	254	196	85	442	2,631	..	...	1	21	...	1	9	31
September ..	407	382	18	10	909	256	140	81	375	2,578	..	...	2	16	...	...	28	49
October	391	435	11	11	922	239	175	86	524	2,794	1	1	...	9	...	1	13	32
November ..	401	457	21	10	985	201	190	88	492	2,845	..	...	1	19	...	...	23	39
December ..	152	228	20	2	337	86	88	58	363	1,334	..	1	2	16	...	...	13	23
1898.																		
January	256	319	13	6	550	129	108	84	379	1,844	..	...	1	26	...	1	37	44
February ..	302	300	33	4	926	218	160	88	372	2,403	..	1	2	17	...	...	28	45
March	276	288	18	8	828	179	148	93	445	2,283	..	1	...	21	...	...	56	47
April	247	345	24	11	1,037	223	163	88	548	2,686	..	1	1	21	...	...	29	61
May	191	376	15	8	924	195	116	62	498	2,385	..	1	5	20	...	2	33	52
June	194	312	18	5	1,133	225	148	51	472	2,558	..	1	3	17	...	1	43	37
Total	3,502	4,246	239	89	10,131	2,467	1,833	922	5,415	28,844	1	8	19	215	...	7	327	508

issued in the fiscal year ended June, 30, 1898.

Other laws.				Act of June 27, 1890.												Grand total.
Act of August, 1892 (Army nurses).	Duplicates.	Accrued pension.	Total under other laws.	Originals.				Additional and sup- plementals.	Increases.	Reissues.	Restorations and re- newals.	Duplicates.	Accrued pension.	Total under act of June 27, 1890.		
				Army invalids.	Army widows.	Navy invalids.	Navy widows.									
5	51	134	2,165	1,348	61	23	371	633	45	184	75	594	5,499	8,136		
3	6	45	2,187	1,291	138	39	372	637	58	181	97	559	5,559	8,307		
3	6	44	2,766	1,257	79	33	373	694	39	160	92	412	5,914	8,640		
7	38	102	1,937	1,352	50	24	390	814	58	209	119	651	5,604	8,500		
2	5	52	2,507	1,400	41	36	356	852	87	200	115	567	6,161	9,147		
4	4	23	1,444	877	33	21	171	344	32	87	74	400	3,483	4,908		
4	16	39	2,876	1,271	89	29	301	518	45	132	128	395	5,784	7,796		
3	3	44	2,420	1,020	141	48	359	1,025	81	205	134	455	5,888	8,424		
2	7	52	2,547	1,272	90	46	364	827	96	203	93	581	6,119	8,588		
2	5	68	2,306	1,261	117	48	415	1,034	144	262	111	592	6,280	9,149		
8	4	58	2,130	1,101	88	23	292	786	79	185	76	578	5,338	7,906		
7	6	45	2,489	1,125	96	36	411	1,061	183	229	104	617	6,350	9,068		
38	74	554	1,751	27,754	14,565	1,022	406	4,175	9,245	947	2,246	1,218	6,401	67,979	98,574	

Original certificates issued under—

General law.....	8,076
Act June 27, 1890.....	43,747
Other laws.....	825
Total originals.....	52,648

Under "Other laws" are included:

	Increase.	Reissue.	Restoration.
Army nurses.....		1	
Widows—War 1812.....	1		
Indian war survivors.....	2		
Indian war widows.....	4		
Old war widows.....	1	1	1
Mexican war survivors.....	261	12	8
Mexican war widows.....	3	2	1
Total.....	272	16	10

Grand total, 298.

REPORT OF THE SECRETARY OF THE INTERIOR.

TABLE No. 17.—Report of the mail division for the fiscal year ended June 30, 1898.

Received.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	Total.
Applications:													
Invalid, original, general law.....	821	867	853	890	725	700	694	546	637	429	381	350	7,893
Invalid, original, act June 27, 1890.....	6,972	7,219	5,727	5,445	3,694	4,203	3,968	3,457	3,931	3,292	2,687	2,761	53,356
Invalid, original, general law.....	1,062	1,143	978	1,047	2,225	1,304	925	836	1,175	926	971	958	13,550
Invalid, original, act June 27, 1890.....	1,666	1,728	1,528	1,570	1,613	1,496	1,650	1,438	1,818	1,714	1,622	1,572	19,415
Widows, original, general law.....													
Widows, original, act June 27, 1890.....	1	3	14	10	7	12	13	11	11	11	11	7	124
Widows, original, 13.....	7	10	41	61	41	35	38	26	79	46	26	27	481
War of 1812: Widows, 13.....	35	26	41	61	66	66	34	49	66	53	47	59	707
Bounty land: Original, 72; widows, 52.....	71	58	75	63	63	29	53	46	44	38	34	33	610
Navy: Original, 960; widows, 532.....	86	72	68	53	59	29	53	35	32	37	29	16	354
Mexican services: Original, 176; widows, 121.....	38	38	32	27	82	26	14	4	8	12	5	4	96
Mexican services: Increase, act of Jan. 5, 1893.....	12	9	10	10	12	5	5	3,062	3,138	2,303	2,214	2,376	58,366
Indian wars: Original, 72; widows, 282.....	8,398	9,546	6,842	6,009	5,521	4,941	3,816	2,054	2,298	597	1,863	1,977	48,451
Act August 2, 1892 (nurses).....	8,560	8,846	6,315	4,687	3,546	3,420	2,535	540	674	573	255	276	6,876
Increase, general law.....	617	547	611	557	516	749	657	86	417	78	121	127	4,015
Increase, act June 27, 1890.....	(¹)	(¹)	(¹)	521	79	68	183	150	90	126	74	78	1,895
Widows, accrued.....	(¹)	(¹)	(¹)	55	98	147	163	97	134	106	106	106	218,439
Arrears.....	(²)	(²)	98	315	176	155	163	97	14,847	12,303	11,035	11,439	123,117
Reimbursement.....	90	248	98	315	176	155	163	97	12,847	12,303	11,035	11,439	6,388
Restoration, general law.....	254				19,438	17,765	15,051	12,847	8,171	7,172	6,246	2,007	20,086
Restoration, act June 27, 1890.....	28,068	30,458	22,503	21,270	9,208	9,282	8,250	7,044	2,082	1,933	1,994	1,994	1,289,700
Restoration, act June 27, 1890.....	17,452	18,041	13,885	11,878	9,208	9,282	8,250	7,044	2,082	1,933	1,994	1,994	34,429
Total.....	17,452	18,041	13,885	11,878	9,208	9,282	8,250	7,044	2,082	1,933	1,994	1,994	1,938
Total number applications, act June 27, 1890.....	1,605	1,382	1,045	1,045	1,045	1,045	1,045	1,045	1,045	1,045	1,045	1,045	1,015
Communications from the Departments.....	97,962	144,134	3,177	3,177	3,496	3,244	3,318	3,593	2,193	2,724	2,042	89	2,965
Pieces of additional evidence.....	3,223	3,313	125	144	263	272	244	76	232	92	331	331	142
Fee agreements.....	56	41	171	171	20	13	26	11	11	8	15	19	122,820
Applications for transfers.....	167	167	167	167	20	13	26	11	11	8	15	19	558,391
Applications for new certificates.....	(¹)	(¹)	(¹)	(¹)	10,228	10,380	9,234	10,016	11,228	10,813	11,035	12,060	37,260
Applications for permits.....	(¹)	(¹)	(¹)	8,361	10,228	10,380	9,234	10,016	11,228	10,813	11,035	12,060	496,927
Reports from Adjutant-General.....	10,511	8,614	8,614	8,361	10,228	10,380	9,234	10,016	11,228	10,813	11,035	12,060	37,260
Letters of inquiry, office letters.....	51,719	56,623	56,623	55,782	66,219	54,357	40,439	44,808	39,391	37,975	36,631	50,400	50,400
Letters, miscellaneous.....	14,799	17,436	17,436	24,002	46,900	47,638	48,169	45,612	43,137	53,186	51,864	50,400	50,400

Army and Navy survivors' division cards.....	4,894	4,924	5,344	5,069	5,773	7,049	6,109	5,395	4,317	4,859	5,601	5,395	5,017
Pension certificates returned by pension agents.....	1,345	2,253	2,052	2,046	2,514	1,015	2,473	2,304	3,441	3,610	4,317	2,045	21,008
Surgeons' certificates.....	19,046	18,938	12,354	10,106	16,214	15,086	14,066	15,000	16,304	21,171	21,171	21,048	21,048
Orders for medical examination returned.....	21,118	20,520	11,986	14,880	13,817	14,371	13,160	13,123	10,032	10,032	10,032	10,032	10,032
Accounts from examining surgeons.....	9,150	8,939	8,311	9,207	8,853	8,778	8,402	7,844	8,158	8,158	8,158	8,158	8,158
Daily reports from special examiners.....	10,497	10,091	10,828	12,120	12,148	12,259	14,088	17,287	17,381	15,808	15,808	15,808	15,808
Dead letters returned by Post-Office Department.....	3,730	3,393	3,183	3,647	3,419	5,191	5,400	4,988	5,529	6,500	6,500	6,500	6,500
Reports and cases from special examiners.....	3,797	3,677	3,410	4,213	3,812	3,894	3,032	3,630	4,157	9,790	9,790	9,790	9,790
Credibility inquiries returned.....	5,214	5,393	3,501	6,036	5,871	3,243	4,047	5,427	5,935	6,196	6,086	5,908	62,617
Congressional communications.....	17,295	14,704	12,967	15,991	14,878	22,393	10,908	18,050	19,301	15,110	14,412	14,580	198,718
Letters referred to chiefs of divisions.....	10,887	12,028	15,984	16,562	12,881	13,831	14,534	14,884	17,685	14,091	14,041	15,120	173,978
Letters referred to special desk, Commissioner's room.....	183	189	208	236	204	162	175	130	165	112	193	227	2,218
Letters referred to the Departments.....	.....	147	196	359	197	179	224	260	230	240	224	238	2,494
Letters returned to writer for data to identify cases.....	3,718	9,734	5,838	2,918	2,746	2,582	2,347	1,904	2,353	1,853	1,067	2,121	40,081
Letters briefed for Record Division.....	.....	.....	.....	.....	.....	.....	.....	.....	7,071	7,772	7,267	4,920	27,030
Total.....	290,590	340,065	294,883	345,751	320,969	324,527	317,783	301,909	348,376	323,408	324,686	332,591	3,871,545
Total letters received.....	102,880	123,884	103,918	102,285	110,428	130,255	105,072	109,136	136,402	110,777	110,778	100,347	1,352,171
OUTGOING MAIL	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Commissioner's reports.....	107	95	113	239	113	71	86	83	130	88	87	82	838
Foreign letters, postage prepaid.....	.....	.....	.....	.....	.....	35	1,335	242	276	117	88	87	1,294
Copies of pension laws.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,180
Blank receipt cards to attorneys: Number of cards, 111,219; packages, 668.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Blank applications.....	3,633	3,162	3,654	5,008	1,945	1,826	1,897	1,255	1,477	1,015	771	881	668
Congressional call slips: Number, 18,050; packages, 62.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	26,024
Letters.....	174,926	1,190	138,691	163,787	153,425	100,652	182,221	162,256	204,417	199,559	189,842	192,781	62
Cards.....	21,370	26,459	23,925	24,898	25,676	22,530	24,543	22,806	23,979	20,578	17,767	18,493	2,054,048
Calls on Adjutant-General.....	10,163	8,178	8,207	10,072	10,222	8,530	10,543	10,078	11,124	10,477	10,826	10,355	273,064
Total.....	210,199	189,865	174,740	204,104	192,013	193,386	220,736	198,868	241,475	221,400	218,935	222,712	118,755
Total number pieces handled.....	529,460	540,398	493,126	571,125	532,420	535,678	553,570	511,624	604,543	567,009	554,859	589,742	2,476,903
Postage stamps received in mail.....	291	304	301	329	348	280	353	328	346	232	224	247	6,566,967
Money received in mail.....	\$230.00	\$2,340.42	\$198.43	\$598.00	\$225.00	\$270.50	\$245.00	\$173.00	\$294.50	\$306.93	\$706.53	\$860.50	3,583
													\$7,444.31

* No record kept until November.

* Included under increase.

* No record kept until October.

ARMY AND NAVY SURVIVORS' DIVISION.

TABLE NO. 18.—*Detailed report of work completed in this division from July 1, 1897, to June 30, 1898, inclusive, showing number of names with post-office addresses furnished, addition to files of service cards, etc.*

	Total names.	Total cases.	Special names.
Eastern division	26,908	2,394	1,313
Middle division	47,687	4,098	1,642
Western division	54,647	4,474	1,706
Southern division	41,851	3,670	1,246
Old War and Navy division	8,261	1,148	1,436
Special examination division	31,315	3,889	2,961
Miscellaneous calls	106,784	17,842	22,651
Total	317,453	37,516	32,955

Total number of names with post-office addresses furnished in 37,516 cases	317,453
Addresses supplied to specified names	32,955
Circular lists of officers and comrades	17,842
Letters and circular letters	64,823
Addition to files, service cards	136,083
Calls on War Department	90

TABLE NO. 19.—Report showing the number of claims of all classes pending at the close of the fiscal year ended June 30, 1898.

	Claims on hand June 30, 1898.	Received to June 30, 1898.	Reopened.	Pending claims received from admitted files.	Applications received prior claim June act rejected.	Total to be accounted for.	Disposals.		Total.	Balance on hand June 30, 1898.
							Admitted.	Rejected or abandoned.		
<i>Service prior to March 4, 1861.</i>										
Old wars:										
Original invalid	309	1	1	1		310		1	1	310
Original widow	54					55				54
Total	363	1	1	1		365		1	1	364
War of 1812:										
Survivor	3	1	1	1		4				4
Widow	61					62				62
Total	64	1	1	1		66				66
Indian wars—Act July 27, 1892:										
Survivor	69	1	1	1		70	1	1	2	68
Widow	727	3	3	3		730	9	3	12	718
Total	796	4	4	4		800	10	4	14	786
Mexican war:										
Survivor	279	1	1	1		280	2		2	278
Widow	922	10	10	10		932	9	6	15	917
Total	1,201	11	11	11		1,212	11	6	17	1,195
Restoration and increase.										
Mexican increase, act January 5, 1893.	379	2	2	2		381				381
Total	1,225	9	9	9		1,234	16	9	25	1,209
Bounty land.										
Service since March 4, 1861.	1,604	11	11	11		1,615	16	9	25	1,590
Army nurses.	241	2	2	2		243	3	2	5	238
General law:										
Original invalid	420					420	2		2	418
Original widow	111,872	1,190	45	40		112,147	358	165	223	111,924
	57,264	3,420	12	13		57,709	460	135	201	57,508
	169,136	610	57	53		169,856	124	300	424	169,432

Army, 64; Navy, 2.

Army, 414; Navy, 6.

Army, 32; Navy, 6.

Army, 177; Navy, 13.

TABLE NO. 19.—Report showing the number of claims of all classes pending at the close of the fiscal year ended June 30, 1898—Continued.

	Claims on hand June 25, 1898.	Received to June 30, 1898.	Reopened.	Pending claims received from admitted files.	Applications received prior claim June act rejected.	Total to be accounted for.	Disposals.		Total.	Balance on hand June 30, 1898.
							Admitted.	Rejected or abandoned.		
<i>Service since March 4, 1861—Continued.</i>										
Act June 27, 1890:										
Original invalid.....	85,222	1,350	28	13	480	86,071	1,445	312	757	85,314
Original widow.....	41,117	732	13	5	85	41,942	4,232	68	300	41,802
Total.....	126,339	1,082	39	18	495	127,973	677	380	1,057	126,916
Invalid claims, act June 27, 1890, consolidated with applications under former laws as follows:										
With pending original invalid.....	8,001	65				8,066	49	58	107	7,969
With rejected or abandoned original invalid.....	48				118	166	42	76	118	48
With certificate invalid pending.....	14,215	86				14,301	28	42	70	14,231
With certificate invalid not pending.....	14,137					14,137	151	91	242	13,896
Total.....	36,401	151			118	36,670	270	267	537	36,133
Widows' claims, act June 27, 1890, consolidated with applications under former laws, as follows:										
With pending widows.....	7,626	106				7,732	11	20	31	7,701
With rejected or abandoned widows.....	687					687	1	5	6	
With certificate widow pending.....	134	2				136				136
With certificate widow not pending.....	7	3				10	8	1	4	6
Total.....	8,454	111				8,565	15	26	41	8,524
Increase:										
Invalid (general law).....	152,835	744	28	746		153,751	838	512	850	152,901
Widows (general law).....	117,223	5				117,228	75		5	117,153
Invalid (act June 27, 1890).....	1	10,940	112	115		11,168	12,239	477	716	117,454
Widows (act June 27, 1890).....	1	4				5	14	3	4	1
Total.....	270,160	1,693	28	51		271,932	583	992	1,575	270,357
Accrued.....	19,087	178				19,265	214	11	225	19,040
Grand total.....	634,266	3,855	126	122	613	638,982	1,925	1,998	3,923	635,059

1 Army, 328; Navy, 22.
 2 Army, 405; Navy, 40.
 3 Army, 706; Navy, 27.
 4 Army, 223; Navy, 7.
 5 Army, 739; Navy, 5.
 6 Increase invalid, 12; increase N. D., 14.
 7 Increase invalid, 27; increase N. D., 18; restoration invalid, 1.
 8 Increase, 257; release, 58; restoration, 43.
 9 Increase, 3; restoration, 2.
 10 Army, 903; Navy, 37.
 11 Increase invalid, 1; restoration invalid, 1.
 12 Increase invalid, 5.
 13 Increase, 239.
 14 Increase, 1.

TABLE NO. 20.—*Operations of the special examination division, showing the number of investigations made, with cost of same, etc., during the fiscal year ended June 30, 1898.*

Amount appropriated by Congress for expenses of special examiners, not including salaries	\$450,000.00
Expenses of special examiners:	
Per diem, in lieu of subsistence	\$287,447.16
Travel, etc., including cost of travel over subsidized railroads	142,641.33
Other expenses incident to investigation of pension agencies	1,081.78
Total	431,170.27
Unexpended balance	18,829.73
Number of cases in division July 1, 1897	15,081
Number of cases received from July 1, 1897, to July 1, 1898	14,680
Total number of cases in the division for fiscal year	29,761
Number of investigations completed during the fiscal year	15,040
Number of cases pending in division July 1, 1898	14,721
Number of special examiners' reports rendered during the fiscal year	41,042
Number of depositions taken	184,091
Average number of reports during the year per examiner	154
Average number of cases completed per examiner	56
Average number of depositions taken per examiner	690
Number of credibility inquiries on hand and received during the fiscal year	16,739
Number of credibility inquiries reported during the year	15,364
Number of credibility inquiries remaining in the division July 1, 1898, not reported	1,375
Average number of special examiners employed in field duty during the fiscal year	266.85
Average cost of special examinations, per report	\$10.48
Average cost per deposition	\$2.34
Average cost per completed case	\$23.50
Average number of reports in completed cases	2.71
Number of special examiners' reports reviewed in division during the fiscal year	36,151
Number of letters written to special examiners	7,829
Number of letters written to Members of Congress	13,826
Number of miscellaneous letters written	1,409
Total number of letters written	23,064
Number of claims submitted to the board of review, after investigation, for final action, with statement of the action of the board thereon:	
Number admitted	6,424
Number rejected	8,367
Number dropped from the roll	213
Number continued on roll	88
Number reduced	7
Number restored to the roll	25
Total	15,124

For statement of the operations of this division in connection with criminal proceedings, number of arrests made, indictments, convictions, etc., amounts of money recovered on account of illegal payments, etc., see report prepared by the law division, which, in cooperation with the special examination division, assumes the direction of criminal proceedings.

TABLE No. 21.—SPECIAL EXAMINATION DIVISION.

DEPARTMENT OF THE INTERIOR,
BUREAU OF PENSIONS,
Washington, D. C., August 23, 1898.

SIR: I have the honor to submit my report of the operations of the special examination division for the year ended June 30, 1898.

The principal duties of this division consist in making special examination in those claims in which it has been found that the usual methods of obtaining evidence are insufficient to enable the Bureau to determine the claimant's rights. In such cases the claim is referred to a special examiner, near the claimant's home, who obtains testimony in the form of depositions, of the claimant and all accessible material witnesses; and, when necessary, the examination is continued in other localities, wherever comrades of the soldier or other material witnesses may reside.

Violations of the pension laws and frauds in the prosecution of claims are also investigated by this division, but the number of claims in which crime or fraud is investigated is really small in comparison with the large number in which investigation is made solely to determine the merits of the claim. Out of a total of 41,042 reports of special examiners submitted during the year, 1,836 refer to criminal charges; the remainder all refer to investigations made relative to the merits of the claim.

The operations of this division are auxiliary to those of other divisions, and ordinarily only the more difficult claims are referred to this division for investigation—claims in which the usual methods of eliciting testimony have been tried without satisfactory result or in which fraud is charged or suspected. This division can make no investigation as to the merits of any claim until the papers have been referred to it from an adjudicating division with the approval of the board of review and accompanied by a slip of reference which clearly defines the purpose and scope of the investigation to be made. Neither can this division take final action in any claim. When its investigation has been completed, the claim is returned to the board of review for its final action upon all the evidence. When criminal acts are disclosed in the investigation, the claim is referred to the law division, which assumes jurisdiction as to its criminal features.

The total number of claims investigated as to their merits by this division and submitted to the board of review for final action during the year was 15,040. Of this number 6,424 have been admitted and 8,367 rejected. The apparently large proportion of claims rejected, of those referred to this division, is accounted for by the fact above referred to, that only the more difficult or doubtful claims are referred to this division for investigation. Claims that are free from doubt do not come to this division, but are adjudicated without reference for special examination.

Of the claims rejected after special examination, a great many would have been rejected, necessarily, had there been no special examination. But it may safely be said that of the 6,424 claims admitted, after special examination, a large percentage could not have been favorably acted upon by the Bureau had it not been for the testimony secured by this division. As to that large class of claims in which, by reason of the death or removal of important witnesses, lapse of time since the late war, and inability of a claimant, for any reason, to procure the evidence

necessary to establish his claim, the operations of this division are most beneficent and helpful to those whose claims possess merit. Our records show that many hundreds of claims are admitted, from year to year, upon evidence which has been secured through the labors and search of special examiners, which the claimant, unaided, would never have been able to procure, and which, for the lack of the necessary evidence thus obtained, the Bureau would have been compelled to reject. These 6,424 claims, admitted after special examination, represent, therefore, the results of the work of this division, in so far as the same proved favorable to the claims investigated.

There are no means of determining with any degree of accuracy the amount of money saved to the Government through the operations of this division. Estimates upon this subject are necessarily conjectural, for the reason that in many cases it can not be determined with certainty whether a rejected claim would not have been rejected had no special examination been made. I think it may be said with confidence that the existence of a large force of special examiners, whose duties bring them in constant touch with the survivors of the war and with the citizens of almost every community, operates in a marked degree to inspire respect for the law and to prevent frauds which otherwise might be committed.

A special feature of the work of this division for the past year has been the investigation of irregularities on the part of notaries public and others in connection with the execution and certification of pension vouchers. It had been ascertained, in pursuance of inquiries which you had directed, that such irregularities had become of frequent occurrence; and this led to your instructions to special examiners for a more thorough investigation in relation thereto. Accordingly, special examiners throughout the country made special inquiry and report in regard to irregular practices of the character mentioned, in the various localities in which they were severally stationed. Evidence thus obtained shows that the failure to comply with the requirements of the law in the identification of pensioners has become a frequent and, in many localities, an almost universal practice. In the vast majority of cases of this kind it would be unwarranted to charge criminal intent. The irregularity, in most instances, consists in the neglect and failure to comply with the formalities prescribed by the statute, the purpose of which is to secure a proper identification of the pensioner, and, in the case of a widow pensioner, to prove that she has not remarried or otherwise forfeited her title to pension subsequent to its allowance. This failure and neglect usually proceed not from any intention to defraud the Government or pensioner, but, in a large number of cases which have been reported to the Bureau, the total disregard and lack of proper identification invite fraud; and instances are not rare in which a pensioner has been falsely personated, or in which a widow has continued to draw her pension long after she has forfeited her right by remarriage. Such frauds, it is true, are not numerous relatively, but they would be still less frequent if the notary or other officer who certifies to the execution of the voucher would in all cases exercise proper care and strictly observe the formalities of identification prescribed by law.

The work of the special examination division in the investigation of this class of irregularities may be summarized by the statement that about 280 special examiners, in making this investigation, reported the general practice of notaries and other certifying officers in nearly every county in the United States where pensioners reside. They also

supplied to the principal notaries, in their respective districts, copies of your circular letter inviting attention to the requirements of the laws and containing a warning against the continuance of the irregularities specified, distributing nearly 50,000 of these circulars, and causing their publication also in several hundred local newspapers, the purpose being, by giving the greatest possible publicity to the existence and nature of the irregularities complained of, to bring about a due respect for and obedience to the requirements of the law, without the necessity of invoking legal proceedings against offenders. It is but proper to say that reports received in this division show already a very marked decrease in these irregularities. The wide publicity given to the measures being employed to correct them has had a salutary influence, tending to secure the desired result in a proper observance of the law.

It should be added that this work of the special examiners in the investigation of these irregularities consumed but little time, and interfered in only a slight degree, and for a few days, with the performance of their ordinary duties.

Closely related to this work of investigating the execution of vouchers is that of verifying the roll of pensioners at the several agencies, which has been begun and is conducted by special examiners who have been specially detailed for that purpose. It has been found expedient at intervals to inspect and verify the rolls at the different agencies with the view to discovering whether payments have been fraudulently procured after a pensioner's death, or to a widow pensioner after her remarriage, or otherwise after termination or forfeiture of the pensioner's title. The rolls of the New York, Philadelphia, Boston, Washington, and Knoxville agencies have been partially investigated. A recent report of the special examiner, who has had supervision of the work at the Eastern agencies, Mr. A. W. Roome, shows results, up to date, as follows: At the New York, Philadelphia, and Boston agencies a total of 182 cases have been found in which pension was being paid in violation of law, classified as follows: Cases of widows who continued to draw pension after their remarriage, and cases in which deceased pensioners were being personated by impostors, 45. Widow who had forfeited their title by violation of the act of Congress of August 7, 1882, and who have been dropped from the roll, 100. Widow who, having been pensioned as dependents under the act of June 27 1890, are found not to be dependent within the meaning of that act and who have been dropped from the roll, 37.

The foregoing do not include the so-called "Munson cases," in which Attorney William A. Munson, of Providence, R. I., by the forgery of vouchers and checks, drew from quarter to quarter the pensions of twenty-one deceased pensioners, amounting to the sum of \$17,806.

Total number of prosecutions commenced for all causes, growing out of the investigations of the three agencies above named, 66; convictions, 18; cases pending, 48.

Total of amounts paid on forged indorsements (including the Munson forgeries), and which amounts have been or will be recovered from the banks through which the collections were made, \$19,752.

The table accompanying this report shows that the number of cases now pending in this division for special examination (14,721) is very nearly the same as the number pending one year ago; also, that the number received in the division during the fiscal year was about equal to the number on hand at the beginning and at the end of the year thus indicating that there is now about one year's work pending in the division; so that the average length of time required to complete the

investigation of a claim referred to this division should be about one year. This statement, however, does not convey a very correct idea as to the length of time required to investigate any given claim, which depends very largely upon the character of the investigation to be made. The investigation of a claim may require but one report. In such event it may be completed within a few weeks after reaching this division. On the other hand, claims are frequently referred to this division in which it is found difficult, if not impossible, to obtain the evidence called for by the board of review, and deemed necessary to the proper adjudication of the claim. Such claims are frequently referred successively to many different special examiners in different parts of the country in the search for evidence. This receiving and referring the same claim back and forth from one examiner and to another, with an additional report from each examiner, necessarily delays its completion, the delay in such case being due mainly to the difficulty in securing the desired evidence.

It would be impracticable, without heavy expense, to keep the work of this division strictly current. Each special examiner is assigned to a certain territory, which in some instances is quite large, and it is found that the work of the division can be disposed of to the best advantage by having these districts of a proper size, and keeping the examiner supplied with three or four months' work.

The appropriation for this division, for the current year, \$400,000, is \$50,000 less than the appropriation for last year, and \$100,000 less than for the year preceding. There does not appear to be a corresponding diminution of the work of the division, and with about one year's work now on hand it would seem that it may be found expedient to recommend a deficiency appropriation, to avoid unusual delays in the settlement of claims referred to this division.

Recapitulating what has already been said, the operations of this division include, necessarily, the important work of investigating fraud, irregularities, and criminal violations of the pension laws, whether committed by claimants, witnesses, attorneys, notaries public, Government officers, or other persons. Yet these investigations constitute but a small part of the work of the division, which consists mainly in making special examination into the merits of the claims referred to it for that purpose. The reference of a claim to this division, therefore, for special examination, is no longer to be taken as an indication that there is necessarily a suspicion of fraud. On the contrary a very large majority of all the claims referred to this division are referred without charge or implication of fraud, and solely to enable the Bureau to determine the claimant's rights. In the performance of this, by far the most important duty of this division, special examiners are required to be impartial, discreet, and just; to treat claimants, witnesses, and all interested parties with courtesy and fairness; to expose fraud fearlessly, when found, and to afford to every claimant the fullest opportunity to cite witnesses in his behalf, and to submit all testimony that in his opinion may tend to establish his claim.

Very respectfully,

A. B. CASSELMAN,
Chief, Special Examination Division.

HON. H. CLAY EVANS,
Commissioner of Pensions.

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TABLE NO. 22—LAW DIVISION.

DEPARTMENT OF THE INTERIOR,
BUREAU OF PENSIONS,
Washington, D. C., August 12, 1898.

SIR: I have the honor to submit herewith my report for the year ended June 30, 1898.

The work of this division, so far as it can be conveniently shown, is set forth in the following table:

Attorneys:	
New attorneys enrolled	430
Prohibitions under section 5498, ceased	3
Restored to practice	14
Total	447
Disqualified:	
By disbarment	29
By suspension	12
By dropping at request	5
By prohibition under section 5498	87
By death	108
Total	241
Increase during year of attorneys entitled to recognition	206
Transfers of attorneyship	38
Changes of address of attorneys	217
Criminal data:	
Cases to Secretary for prosecution	115
Arrests made	187
Indictments found	228
Convictions secured	145
Sentences imposed	100
Acquittals	35
Cases dismissed on nolle prosequi	18
Cash recovered for the United States:	
Collected by special examiners	\$4, 221. 52
Collected by four civil suits	6, 332. 18
Total	10, 553. 70
Amount of judgments secured, not yet realized on (four suits)	11, 416. 22
Amount of fees recovered which had been erroneously paid by the Bureau	2, 080. 00
Miscellaneous:	
Cases on hand July 1, 1897	373
Cases received during year	12, 998
Total	13, 371
Cases examined and referred to Secretary of Interior	205
Cases examined and referred to special examination division ..	1, 414
Cases examined and referred to other divisions	10, 296
Cases sent to Congress	1, 002
Total	12, 917
Cases on hand July 1	454
Reports made to Congress	403
Letters written	20, 025
Type-written pages	38, 778
Stenographic pages	19, 339
Mimeographic pages	45, 575
Special examination reports reviewed	1, 270
Marriage certificates returned	160
Abstracts of testimony furnished for auditors	1, 900
Opinions rendered in cases of marriage and divorce	503

A large amount of miscellaneous work has been performed which can not be shown in tabular form.

CRIMINAL AND CIVIL SUITS.

Of suits, civil and criminal, during the year, 188 cases, arising out of claims for pension, were tried, 180 of which were criminal and 8 civil, resulting in 153 verdicts for the Government and 35 acquittals. More than 81 per cent of the cases were won. Of the 35 cases lost 12 were against witnesses, in which the jury seemed to believe that the parties were merely tools of the culprits, whom they convicted, and 3 were ex-slave bill impostors, who escaped conviction because under the act of April 18, 1884, it is necessary to show, beyond a reasonable doubt, that money or other thing of value was received under cover of the impostor's pretended official character, and for the further reason that each of these men had a certificate issued by one of the ex-slave associations, and claimed to be working under the authority conferred thereby. It was, however, in each case shown that the defendants had collected money under false pretenses.

It has been the policy of this division to recommend the prosecution of persons only who have deliberately violated the law, and the fact that less than 19 per cent of the cases have been lost is of itself the best evidence of the success of the methods employed.

One of the most interesting and important cases developed during the year has been that against William A. Munson, a notary public and pension attorney of Providence, R. I., for forgery. As a pension attorney Munson had considerable practice in and around the city of Providence. After the allowance of a claim in which he had been the attorney, he usually kept the pension certificate in his office and executed the quarterly vouchers for the pensioner. If a pensioner who regularly executed pension vouchers before Munson died, he continued to execute the vouchers, forging the name of the pensioner and usually that of the indentifying witnesses thereto, as well as the payee's name to the check when issued. After the December, 1897, payment, sixteen letters containing pension checks were returned to the United States pension agent at Boston from Providence unclaimed. The matter was made the subject of a special investigation. As a result of this investigation it has been found that of the sixteen cases originally sent out fourteen of the pensioners had died and two had remarried at different times prior to July, 1897. In one case an aunt of Munson died in 1887. He continued to draw her pension until September 3, 1897. In another, he continued to receive the pension of his sister, the widow of a soldier, after his sister died at his house in 1892.

Besides the cases first examined, three more were discovered in which Munson had illegally drawn the pension of parties who had died or remarried. The amount paid out by the Government by reason of Munson's wholesale forgeries approximates \$20,000. Indictments were found against Munson and five accomplices, and at the June term of the United States district court he entered a plea of guilty in two cases, and was sentenced to imprisonment in the penitentiary for five years. Cornelius Draper, one of his stock witnesses, was convicted at the same term, and sentenced to one year in the penitentiary. There are quite a number of indictments still pending against Munson and his associates. The banks which cashed the forged checks for Munson and his accomplices have been notified that reclamation will be demanded on said checks.

Investigation has shown, beyond a doubt, that certain attorneys have been guilty of wholesale fabrications of declarations and affidavits, or, rather, papers purporting to be such, by causing them to be signed in blank, by deceiving witnesses as to the contents of their affidavits, by causing complaisant executing officers to place their jurats upon papers to which they have not sworn the witnesses, and by forging jurats and altering records. The man who, by impersonation, perjury, or forgery in his own behalf, defrauds the Government out of a single pension, is usually a clumsy culprit, of no standing, and an easy man to convict; while the man who fabricates papers and contaminates many claims, is, as a rule, a man of more or less ability, of fairly good standing and education, and possessed of means to avail himself of every technicality of the law.

One of these men, a leading citizen in the community in which he resides, and heretofore a man of first-class reputation, admitted in set terms that he had been in the habit of writing notaries' signatures to jurats, had used his own seal, after erasing his name therefrom, on such papers, that he had altered material dates, and had made other important changes in affidavits, setting up as his only defense that he had satisfied himself that the clients whose claims were made out by such fabricated instruments were justly entitled to all that was claimed for them.

Since the close of the fiscal year, section 4746, Revised Statutes, has been amended to reach this class of offenses. The amended section is as follows:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section forty-seven hundred and forty-six of the Revised Statutes of the United States is hereby amended to read as follows:

"That every person who knowingly or willfully makes or aids, or assists in the making, or in any wise procures the making or presentation of any false or fraudulent affidavit, declaration, certificate, voucher, or paper or writing purporting to be such, concerning any claim for pension or payment thereof, or pertaining to any other matter within the jurisdiction of the Commissioner of Pensions or of the Secretary of the Interior, or who knowingly or willfully makes or causes to be made, or aids or assists in the making, or presents or causes to be presented at any pension agency any power of attorney or other paper required as a voucher in drawing a pension, which paper bears a date subsequent to that upon which it was actually signed or acknowledged by the pensioner, and every person before whom any declaration, affidavit, voucher, or other paper or writing to be used in aid of the prosecution of any claim for pension or bounty land or payment thereof purports to have been executed who shall knowingly certify that the declarant, affiant, or witness named in such declaration, affidavit, voucher, or other paper or writing personally appeared before him and was sworn thereto, or acknowledged the execution thereof, when, in fact, such declarant, affiant, or witness did not personally appear before him or was not sworn thereto, or did not acknowledge the execution thereof, shall be punished by a fine not exceeding five hundred dollars, or by imprisonment for a term of not more than five years."

Approved July 7, 1898.

There are now over 300 cases of a criminal nature pending in the hands of the United States district attorneys.

MONEY RECOVERED.

The sum of \$4,221.52, improperly obtained under pension claims, was recovered by special examiners. Six thousand three hundred and thirty-two dollars and eighteen cents was recovered through four civil suits, and judgments were rendered in four other civil suits aggregating \$11,416.22, though the same have not yet been realized upon.

This only represents a portion of the money recovered, as reclamation on forged checks is made through the Treasury Department, and we have no data as to the amount so recovered.

IMPOSTORS.

During the past year the impostor files have been carefully examined and cases jacketed containing all essential data as to the operations of each impostor. Wherever it was possible to do so, photographs of the men have been obtained, and a correct index has been made, showing where each man has operated, and giving his personal description, a tracing of his handwriting, if obtainable, and all miscellaneous information pertaining to the impostors has been secured for purposes of identifying them if, at some future date, they should again commence operations. These files have been of material service in the identification of old offenders, in causing their arrest when they have again violated the laws, notably in the Cralle case.

GUARDIANSHIP.

The Federal courts have no power to appoint guardians, and hence this Bureau has necessarily to avail itself of the machinery of the State courts in their appointment and in the settlement of accounts.

It is extremely difficult for this Bureau to protect the interest of insane persons and minor children who are pensioners, and owing to their peculiarly helpless and dependent condition they should be, as far as practicable, regarded as the wards of the nation, and every effort made to see that they receive the full benefit of the bounty of the Government. In many cases the criminal prosecution of guardians, committees, and other persons having charge, in a fiduciary capacity, of the pension money of their wards, and who have embezzled the same, has been barred by the statute of limitations before it was possible, with the existing legal machinery, to discover that they had been guilty of fraudulent conversion, and to complete the necessary equity proceedings to compel an accounting; and hence I would suggest that the United States district courts be vested with authority to appoint guardians, to receive and disburse the pension money of their wards under the directions of said courts; that the limitation for prosecution shall not run until the minor ward shall have attained his majority, or the insane ward shall have been restored to his civil rights, and that the failure of a guardian to pay into the registry of the court the amount found due his ward, on proceedings had, within a period of ninety days from the filing of an order of the court, shall constitute prima facie evidence of embezzlement and fraudulent conversion of the amount involved.

EXECUTION OF VOUCHERS.

The investigation bearing on the execution of pension vouchers ordered by you in April has demonstrated its wisdom and necessity by the results obtained. While it was believed that the law and regulations pertaining to their execution were in some instances not strictly complied with, the developments attending the work of special examiners has shown an alarming disregard of the established regulations, and a surprising indifference to even the law in the case. While many officials comply strictly with the laws and regulations governing the execution of such instruments, there are a great many, some through ignorance, and others intentionally, who disregard both the law and regulations in connection with this part of their work.

Postdating vouchers, failure to have pensioners exhibit their certificates, furnishing witnesses who have no knowledge of the facts to which they testify, and failure to administer an oath to either pensioners or their witnesses are a few of the many illegal and irregular practices disclosed by the investigation. Section 4746, Revised Statutes, as amended by the act of July 7, 1898, is relied upon to remove, in a large measure, these irregularities.

The magnitude of the evil and the diversity of the characteristics involved have been found so great that when the intent, intelligence, and social condition of the parties implicated were considered it was deemed wise, instead of instituting criminal proceedings, to issue a circular of warning to govern in future the acts of those officials who engage in this class of work. With this end in view a circular letter (3-498), of which the following is a copy, was prepared for general distribution:

SIR: Recent investigation had by this Bureau to ascertain the methods employed by public officials in executing pension vouchers has demonstrated an almost total disregard of the laws and regulations governing the subject.

It is clearly evidenced that the illegal, lax, indifferent, and perfunctory procedure now extant has become a menace to the proper and safe conduct of the affairs of this Bureau so far as it relates to the payment of pensions, and special efforts are contemplated to correct the existing abuses.

While it is believed that many officials who assist in the execution of pension vouchers have no conception of their criminal liability in the premises, it is equally certain that many others, to secure an advantage in the numerical number of their clientage, knowingly and willfully resort to violations of the law.

To the end that the former class may profit by this notice this circular is issued.

There can be no justification in the prevalent haste and laxity existing in many offices by which post dating, false certification, false claim, and "stock" witnesses have become a factor in the administration and acknowledgment of pension vouchers.

It is the intention of this Bureau, where the facts warrant such action, to institute criminal proceedings against the parties who indulge in these illegal and irregular practices, and they are warned accordingly.

By following strictly the instructions printed on each voucher the matter complained of may be entirely remedied.

Very respectfully,

H. CLAY EVANS,
Commissioner.

During the progress of the investigation this division has, in connection therewith, examined 350 special examiners' reports and has written over 1,000 letters, in addition to the circulation of this circular letter. The distribution of the 50,000 circular letters by the special examination division is now under way and is being rapidly accomplished.

This circular letter, with more or less favorable editorial comment, has found its way into several hundred newspapers in every section of the country. The great publicity given to the requirements of the Bureau in the execution of pension vouchers will result in removing the prevailing ignorance of the law and regulations, and a wholesome reform in the work is anticipated.

It is believed that better results have been obtained through the lenient action of the Bureau in warning officials to comply with the law and regulations than there would have been had the law been invoked. The requirements in the matter of the execution of pension vouchers having been made public through the press and through the efforts of the special examination division in distributing the circular of warning, there can be no excuse in the future for any official resorting to lax or illegal methods; and it is the intention of this division, with your

approval, to hereafter institute criminal proceedings in every case in which the evidence is sufficient to warrant prosecution.

The investigation also disclosed the necessity of improving the form of voucher, and this work has already been accomplished.

PAWNING PENSION CERTIFICATES.

The pawning or pledging of pension certificates is a growing evil, and some stringent measure should be adopted to reach the offense, and, if possible, to effectually stop it.

It has been developed, by investigations made in several cases of this nature, that unscrupulous persons have accepted as security for money loaned to needy pensioners their pension certificates and vouchers, charging them interest on the amounts so loaned ranging from 5 to 50 per cent per month. This practice is not confined to any one place, but is indulged in to a greater or less extent in most, if not all, of the principal cities throughout the country.

The possession of a pension certificate is usually the only evidence a magistrate has to show that the holder is the party entitled to execute the voucher upon which payment of pension is to be made. With the certificate in the possession of usurious money lenders and other unscrupulous persons, the danger to the Federal Treasury in the event of the pensioner's death is apparent.

The present law governing the pawning or pledging of pension certificates is inadequate to reach the offenders, and in view of recent developments showing the extent of this practice, the holding of a pension certificate by anyone other than the person who is under the law actually entitled to its possession, should be made to constitute an offense of such a character as would warrant a more severe punishment than the present law provides.

DELIVERY OF MAIL TO PENSIONERS.

It has also been shown during the year that the post-office regulations which prohibit the delivery of mail addressed to pensioners by United States pension agents to any other person than the pensioner, or a member of his family, have been in many instances disregarded. In numerous cities pensioner's checks, instead of being delivered to the pensioner or a member of the family, as required by the Postal Regulations, have been delivered to pension attorneys and other persons not entitled to them, in many cases such parties being money lenders who desired to have the checks come into their possession, and thereby secure an advantage in insuring the repayment of money loaned. In Philadelphia, Pa., New York, N. Y., Boston, Mass., Chicago, Ill., and Nashville, Tenn., this practice is shown to have existed, and in some instances as high as 100 checks for different pensioners were delivered at the address or placed in the post-office box of some person not entitled to their possession. The same condition of affairs was found to exist in Washington, D. C., Providence, R. I., and some other cities throughout the country.

If the regulations of the Post-Office Department had been complied with at Providence, R. I., it is believed that it would not have been possible for Pension Attorney William A. Munson to have carried on wholesale frauds in drawing many pensions, for which he has lately been convicted. It is proper to add, however, that in each instance in which the Post-Office Department has been advised of the violation of

the postal regulations in this respect they have promptly cooperated with this Bureau to correct the evil, and a vast improvement is noticeable.

ATTORNEYS.

During the year 241 attorneys have been disqualified for the following causes: Disbarment, 29; suspension, 12; dropped, 5; section 5498, R. S., 87, and by death, 108. During the same period 14 attorneys were restored to practice and the prohibition under section 5498 standing against 3 attorneys was removed, and 430 new attorneys were enrolled as entitled to recognition, making a net increase in the roster of pension attorneys of 206.

The roster of attorneys practicing before this Bureau has enrolled upon it the names of some 60,000 persons, who have at different times since 1860 complied with the requirements of the Department for such enrollment. Prior to July 4, 1884, the only requirement was that the person desiring to be enrolled should subscribe to the oath of allegiance. Since the passage of the act of July 4, 1884, admission to practice has been made by the Secretary of the Interior, and applicants have been required to furnish some guaranty of their ability to perform the duties incumbent upon attorneys and agents prosecuting pension claims.

A great number of those who have been enrolled as attorneys and agents never contemplated the active prosecution of claims, and many of those who did, have since abandoned their practice, removed to other parts of the country, died, etc. The bulk of the business of prosecuting pension claims is now being performed by about 1,000 attorneys, but since 1884 no attempt has been made to revise or correct the roster by eliminating therefrom the names of those who have ceased to practice. The old books of enrollment, besides being overcrowded, were becoming illegible on account of age and the wear and tear upon them, and have lately given place to a system of enrollment upon cards.

For many years there has been an increasing need of a revision of the roster, and the present time, when the system is being changed, is an opportune occasion to undertake the task. Such revision, however, should be so arranged that no injustice or hardship will be imposed upon any individual or firm now entitled to or who may hereafter apply for recognition before this Bureau. A proper revision would result in reducing the number of names upon the attorney roster materially, and it is believed would have the support of every reputable attorney practicing before the Bureau.

It is therefore respectfully recommended that the regulations governing the recognition of attorneys be amended upon the following lines:

1. That the Commissioner of Pensions be authorized and directed to address to each attorney or agent whose name is borne upon the rolls a circular letter, setting forth, among other things, that on and after January 1, 1899, no one not registered as hereinafter described will be recognized to practice as a pension claim agent or attorney.

2. That from and after January 1, 1899, a register of attorneys shall be kept in the Pension Bureau, upon which shall be entered the names of all persons entitled to represent claimants before the Pension Bureau in the presentation and prosecution of claims.

3. That the names of the persons in the following classes will, upon their written request, be entered upon said register.

a. Any person who, on January 1, 1899, is engaged as an attorney or agent in the active prosecution of claims before the Pension Bureau, or who was so engaged at any time within five years prior thereto, and is not disbarred or suspended, or is or was during such period a member of a firm so engaged and not disbarred or suspended: *Provided*, That such person shall, if required, furnish information as to one or more claims for pension so prosecuted by him.

b. Any firm which, on January 1, 1899, is engaged in the active prosecution as attorneys or agents of claims before the Pension Bureau, or had been so engaged at any time within five years prior thereto: *Provided*, That such firm, or any member thereof, is not disbarred or suspended: *And provided further*, That the names and dates of admission of the individuals composing the firm are stated, and such firm shall, if required, furnish information as to one or more claims prosecuted by it before the Pension Bureau.

c. Any firm not entitled to registration under the preceding sections which shall show that the individuals composing the firm are each and all recognized as pension claim attorneys or agents, or are each and all entitled to be so recognized.

4. That the Commissioner of Pensions is authorized and directed to make a report to the Secretary of the Interior upon all applications for registration under the above regulations which in his judgment should not be granted, giving his reasons therefor; and such applicants for registration shall not be recognized unless the Secretary of the Interior shall render a decision in the matter favorable to the applicant.

5. That on and after January 1, 1899, admission to practice as pension claim attorneys will be conferred by the Secretary of the Interior upon attorneys at law, upon application, as follows:

a. An applicant must file a certificate of the clerk of a United States, State, or Territorial court, duly authenticated and under the seal of said court, that he is an attorney in good standing.

b. The oath of allegiance required by section 3478 of the Revised Statutes of the United States must also be filed.

c. In the case of a firm the names of the individuals composing the firm must be given, and a certificate and oath as to each member of the firm will be required.

d. An applicant for admission to practice under this regulation must address a letter to the Secretary of the Interior, inclosing the certificate and oath above required, in which letter his full name and post-office address must be given. He must state whether or not he has ever been recognized as an attorney or agent before this Department or any bureau thereof, and if so, whether he has ever been suspended or disbarred from practice. He must also state whether he holds any office of trust or profit under the Government of the United States.

It will be noted that the above proposed amendments to the regulations governing the recognition of attorneys and agents in pension claims do not contemplate the admission to practice in the future of any person who is not an attorney at law. I am convinced of the wisdom of restricting admission to practice generally to members of the bar in good standing before the courts. Valuable assistance to claimants can only be rendered by competent attorneys. For this work some knowledge of pension law, the rules of evidence, and the preparation of legal papers is requisite. The illiteracy, incapacity, and dishonesty which has characterized the work of some of those who have engaged in this business has been a constant source of trouble to clients and

tribunal. The misconstruction and misconception of the requirements of the Bureau, the filing of confused, irrelevant, and contradictory evidence, and the frequent exactions of sums of money from claimants for alleged "expenses" on the part of ignorant and unscrupulous attorneys and agents have caused delays, increase of work, and, doubtless, has resulted in the abandonment or rejection of many meritorious claims. By confining recognition in the future to those who are now actively engaged in the prosecution of claims and members of the bar, a higher tone would be given to the practice and much advantage would accrue to claimants and to this Bureau. This recommendation is also in the line of economy, as, if the revision were complete, the expense attendant upon the work of the "attorneys' desk" could be reduced one-half.

MARRIAGE.

Except as provided by section 4705 of the Revised Statutes of the United States, the Bureau is, under existing law, compelled to decide questions of marriage according to the *lex contracti*, or by the law of the place where the parties resided when the right to pension accrued.

On account of the wide variance between the laws of the different States governing the question of marriage, I am of the opinion that the act of August 7, 1882, should be so amended as to permit this Bureau to admit evidence as to common-law marriage which would be uniform within the entire jurisdiction of the United States. This would benefit many otherwise meritorious widow claimants who, under the present law, are denied a pensionable status.

FEES.

There was refunded by attorneys and agents \$2,080 on account of fees which had been erroneously certified and paid to them, this sum being considerably less than for previous years. While Order 354, approved January 15, 1898, under which requests of attorneys for consideration of title to fees are not entertained unless filed in the Bureau within three years from the date of issue upon which fee is claimed, has in part caused the reduction in the amount recovered, it also indicates that questions relating to fees have during the past year been carefully adjudicated.

SPECIAL ACTS.

During the earlier days of your administration the necessity of a more complete record of special acts granting pension passed by Congress, and the action taken by the Bureau in each case, became apparent.

Beginning with the present Congress, a system was inaugurated in this division whereby complete data is shown covering each special pension act passed, together with the action of the Bureau thereunder. In future the data covering any special act or number of special acts can be furnished at a moment's notice.

Upon calls made, the papers in 1,002 pension cases have been forwarded to the appropriate committees of the present Congress, and reports were made to Congress in 403 additional cases.

LIBRARY FUND.

There is no fund available for the purchase of books which are required in the library for the use of the Bureau in determining questions of law. It is recommended that the Congress be asked to appropriate the sum of \$500 for this purpose, to be expended under your direction.

In conclusion, I desire to acknowledge the valuable services rendered by Mr. George O. Stewart, who, as assistant chief, has charge of the criminal work of this division.

Very respectfully,

S. A. CUDDY,
Chief of Law Division.

Hon. H. CLAY EVANS,
Commissioner of Pensions.

TABLE NO. 23.—*Showing number of special acts by each Congress,*

Final monthly allowance under special act.	Congress.								
	Thirty- seventh (1861-63).	Thirty- eighth (1863-65).	Thirty- ninth (1865-67).	Fortieth (1867-69).	Forty- first (1869-71).	Forty- second (1871-73).	Forty- third (1873-75).	Forty- fourth (1875-77).	Forty- fifth (1877-79).
\$5,000									
3,724									
3,000					1				
2,500						1			
2,000									
1,500			3	1					
1,272			1						
100									2
75									
72							3	2	7
60									
57									
55									
54									
50	3	3		4	1	3	4	8	13
49									
48									
47									
46									
45½			1						
45									
42									
40						1			
38									
37.50							1		
36						1			1
35							1		
33									
32						1	1	1	
31.25				1		5	6	1	
30	2	2	5	8	5	7	11	11	34
28				1		1			
27							2		
26			1						
25.33			15	11	3	5	1	2	10
25	2	1		1	1	7	14	4	16
24				1					
23									
22				1			1		
21									
20	1	4	17	13	6	10	8	7	17
19				3		1			
18.75									1
18				3	1	5	9	3	4
17		1	8	14	4	8	10	1	6
16				1	1	1	1		4
15	1		18	26	6	8	8	4	7
14.85									
14				6	1	1	3	2	2
13							1		
12.75						1			
12.72									
12.50									
12.25									
12			1	3	2	7	7	1	40
11.25					1				
10			2	7	1	8	6	2	2
9.50									
9									
8.50						1			2
8	3	12	61	159	44	81	70	30	38
7.50									
6.66½				1					
6		1	1	6	3	2	7	2	7
5			1				1		
4.25							1		
4		3	1	2	3	5	5	13	7
3.85									
3.75									
3						1			
2½			1						
2				2	1	1	2		1
No issue.			1				2	4	9
Total...	12	27	138	275	85	167	182	98	230

a Per annum.

b Accrued pension paid to administrator.

PENSIONS.

61

classified by rate, from March 4, 1861, to March 4, 1897.

Congress.									Total.
Forty-sixth (1879-81).	Forty-seventh (1881-83).	Forty-eighth (1883-85).	Forty-ninth (1885-87).	Fiftieth (1887-89).	Fifty-first (1889-91).	Fifty-second (1891-93).	Fifty-third (1893-95).	Fifty-fourth (1895-97).	
	4	1							5
					1				1
					1				1
		1	1	2	3				2
									8
									4
									1
									45
									15
									104
									12
									1
									1
									1
									398
									2
									2
									1
									1
									84
									3
									105
									1
									5
									49
									12
									1
									3
									14
									484
									1
									7
									2
									1
									237
									177
									1
									7
									2
									416
									4
									4
									125
									174
									77
									171
									3
									46
									6
									1
									1
									2
									1
									1,647
									1
									117
									2
									3
									8
									1,057
									3
									2
									104
									5
									1
									191
									4
									1
									1
									1
									50
									66
96	216	598	856	1,015	1,388	217	119	378	6,097

c Pension paid to daughter-in-law for nursing soldier in lieu of Revolutionary war pension due him.
d Accrued pension.

TABLE NO. 24.—Showing special acts granting pensions passed at the second session of the Fifty-fifth Congress, arranged according to class, date of approval, name of beneficiary, and name, rank, and service of soldier upon whose service pension is based, together with monthly rate by special act, monthly allowance prior to passage of special act, and increase in each case by reason of passage of special act.

Class.	Date of special act.	Name of pensioner.	Name of soldier.	Rank and service.	Monthly rate.		Increase by reason of special act.
					By special act.	Prior to special act.	
Widow	Feb. 14, 1898	Emily E. Atherton	Benjamin F. Atherton	Capt., Co. C, 1st Me. H. A.	\$20.00		\$20.00
Do	do	Mary W. C. Burgess	Benjamin F. Burgess	Acting asst. surg., U. S. A.	17.00		17.00
Do	do	Ellis D. Cross	Richard E. Cross	Lieut. Col. 5th N. Y. Vols	30.00		30.00
Invalid	do	Benjamin F. Tuck	Same	Private, Co. H, 10th Mass. Vol. Inf.	30.00	\$12.00	18.00
Mother	Mar. 3, 1898	Marletta Hayes	Watson Hayes	Private, Co. E, 16th Ohio Inf.	12.00		12.00
Invalid	Mar. 5, 1898	John Ames	Same	Private, Co. E, 28th Ohio Inf.	30.00	17.00	13.00
Widow	do	Ezther Brown	James Brown	Capt., Co. E, 28th Ohio Inf.	30.00	17.00	13.00
Do	do	Margaret C. Calhoun	James Calhoun	Lieut. 7th U. S. Cav.	12.00	4.00	8.00
Invalid	do	Henry B. Conway	Same	Capt., Co. F, 24 Ill. Vols (Mex. war)	30.00	17.00	13.00
Do	do	John W. Dodd	Same	Capt., Co. A, 4th Ind. Inf. (Mex. war)	30.00	12.00	18.00
Widow	do	John L. Fagg	John A. Fagg	Lieut. Col. N. C. Vols (Mex. war)	30.00	12.00	18.00
Do	do	Martha F. Fagg	William Frank	Private, Capt. Little's Co. Ind. war of 1818	12.00	8.00	4.00
Invalid	do	John F. Hathaway	Same	Acting asst. surg., 4th Indian Brigade U. S. A.	8.00		8.00
Invalid	do	Rachel Kern	James M. Allen	Corpl., Co. D, 12th Pa. Reserve Inf.	17.00		17.00
Do	do	Charles A. Nazro	Same	Acting Q. M. and 1st Bent. Co. F, 26th Ill. Inf.	12.00		12.00
Widow	do	Hiram H. Palmer	George Rowell	Private, Co. A, 6th Wis. Inf.	50.00	17.00	33.00
Do	do	Margaret Rowell	Same	Private, Co. F and D, 4th U. S. Inf.	30.00	12.00	18.00
Widow	Mar. 14, 1898	Annie Fowler	Edward B. Fowler	Private, Co. F, 1st Conn. H. A.	20.00		20.00
Invalid	do	William H. Morgan	Same	Private, Co. F, 12th Ind. Inf.	30.00	17.00	13.00
Do	do	Joshua Parker	Same	Private, Co. F, 1st Conn. H. A.	40.00	24.00	16.00
Widow	do	Emeline G. Sewell	George Sewell	Chief engineer U. S. Navy	30.00		30.00
Invalid	do	John Q. Washburn	Same	Capt., Co. K, 129th Ind. Inf.	50.00	24.00	26.00
Do	do	William N. Wells	Same	Acting master U. S. Navy	30.00	10.00	20.00
Widow	do	Esther Williams	Gilbert M. Williams	Private, Capt. Stephen's Co. Ga. Vols., Fla. war	12.00	8.00	4.00
Invalid	Mar. 19, 1898	James Eganston	Same	Seaman U. S. Navy	8.00		8.00
Do	do	Riley W. Pierce	Same	Private, Capt. James Smith's Co., Tex. Mtd. Vols. (Mex. war)	8.00		8.00
Do	do	John A. Worwick	Same	Private, Co. H, 18th Wis. Inf.	20.00	8.00	12.00
Widow	Mar. 23, 1898	Caroline W. Abney	Mathew W. Abney	Private, Capt. Denny's Co., S. C. Vols., Ind. wars, 1832-1842	12.00	8.00	4.00
Invalid	do	Napoleon B. Breedlove	Same	Private, Co. G, 4th La. Vols., Mex. war	20.00	12.00	8.00
Widow	do	Florence W. Buskirk	John W. Buskirk	Corpl., Co. G, 49th Iowa Inf.	20.00	8.00	12.00
Do	do	Martha S. Harlee	William W. Harlee	Maj., S. C. Mil., Indian wars from 1832 to 1842	12.00	8.00	4.00
Invalid	do	William D. Lamb	Same	Acting asst. surg., U. S. A.	17.00		17.00
Widow	do	Cornelia I. Skiles	John W. Skiles	Maj., 88th Ohio Inf.	25.00	8.00	17.00
Invalid	Mar. 31, 1898	John J. Boatwright	Same	Private, Co. I, 24th Ohio Inf.	30.00	14.00	16.00
Do	do	Joseph V. Bowley	Same	Sergt., Co. D, 14th N. H. Inf.	30.00	8.00	22.00
Widow	do	Mary F. Hawley	John B. Hawley	Capt., Co. H, 46th Ill. Inf.	20.00		20.00
Nurse	do	Mary Hayne	Same	Nurse, Med. Dept., U. S. Vols.	12.00		12.00

TABLE NO. 24.—Showing special acts granting pensions passed at the second session of the Fifty-fifth Congress, etc.,—Continued

Class.	Date of special act.	Name of pensioner.	Name of soldier.	Rank and service.	Monthly rate.		Increase by reason of special act.
					By special act.	Prior to special act.	
Widow	Apr. 13, 1898	Caroline A. Slocum	Willard Slocum	Lieut. col., 120th Ohio Inf.	\$30.00		\$30.00
Do.	do	Olevia S. Washburn	John H. Dale	Private, Co. C, 13th Tenn. Cav.	12.00		12.00
Invalid	do	Robert P. Wild	Same	Private, Co. E, 2d N. C. Mid. Inf.	20.00	\$12.00	8.00
Widow	Apr. 15, 1898	Laura A. Barry	Charles W. Barry	Private, Co. B, 108th N. Y. Vol. Inf.	8.00		8.00
Do.	do	Isabella G. Daniels	Milton T. Daniels	Private, Co. A, 1st Mass. Cav.	20.00	12.00	8.00
Stepmother	do	Ellen Day	Albert L. Day	Private, Co. I, 5th Ohio Inf.	12.00		12.00
Nurse	do	Sarah A. Denny	Same	Nurse, Med. Dept., U. S. Vols.	12.00		12.00
Invalid	do	Samuel F. Fowler	Same	Private, Co. A, 1st U. S. Inf.	20.00	8.00	12.00
Do.	do	Nicholas Gardner	Same	Private, Co. D, 101st Ind. Inf. and 19th Batty, Ind. L. A.	50.00	17.00	33.00
Do.	do	James J. Gibbs	Same	Private, Capt. G. White's Co., Natl. Gds., E. Tenn.	10.00		10.00
Do.	do	Joseph P. Harmon	Same	Private, Co. B, 7th Me. Inf. and K, 5th Me. Inf.	30.00	12.00	18.00
Nurse	do	Nancy Hollenbank, formerly Boaz nee Yaley.	Same	Nurse, Med. Dept., U. S. Vols.	12.00		12.00
Minor	do	Emily J. Miller	Robert B. Miller	Private, Co. C, 108th N. Y. Vol. Inf.	15.00		15.00
Widow	do	Corra L. Robinson	Leonidas L. Robinson	3d Lieut., Rev. Cutter Service, Icy Bay (Alaska) Exp. May, 1891.	15.00		15.00
Invalid	do	Elwin A. Scutt	Elwin A. Scutt	Private, Co. I, 151st N. Y. Vol. Inf.	16.00	8.00	8.00
Do.	do	Daniel J. Smith	Same	Private, Capt. Pouncey's Co. Ala. Mil., Fla. war.	12.00	8.00	4.00
Do.	do	Jerome A. Stanton	Same	Scout and master of transportation, 7th Army Corps, U. S. A.	18.00		18.00
Helpless child	do	Walter D. Weaver	George M. Weaver	Private, Co. K, 185th N. Y. Vol. Inf.	15.00		15.00
Widow	Apr. 27, 1898	M. Louise Anderson	John B. Anderson	Private, Co. K, 17th Mich. Inf.	24.00	8.00	16.00
Invalid	do	Charles B. Eates	Same	Private, Co. K, 11th Ky. Inf.	24.00	12.00	12.00
Widow	do	Sarah R. Frary	Jedediah C. W. Frary	Private, Co. H, 18th N. H. Vol. Inf.	8.00		8.00
Invalid	do	Jacob G. Frick	Same	Col., 27th Pa. Mil. Inf.; Col., 129th Pa. Inf.; Lieut. Col., 90th Pa. Inf.	50.00	27.50	22.50
Widow	do	Della Gilman	Alvin Gilman	Private, Co. H, 5th N. H. Vol. Inf.	12.00		12.00
Invalid	do	Johnson Hayes	Same	Private, Co. G, 7th Mo. S. M. Cav.	17.00	16.00	1.00
Do.	do	Benjamin F. Howland	Same	Wholesale Edward, Mex. war.	8.00		8.00
Widow	do	Rosa Karger	William Karger	Landman, U. S. Navy.	12.00	8.00	4.00
Do.	do	Sarah A. Landram	William J. Landram	Col., 18th Ky. Inf.	30.00		30.00
Do.	do	Elizabeth Lane	Joseph Lane	Capt., Co. F, 63d Ind. Inf.	40.00	20.00	20.00
Do.	do	Elen Larned	Frank H. Larned	Maj., 1st U. S. Artillery and Capt. 2d U. S. Art y.	25.00	8.00	17.00
Nurse	do	Catharine Leary	Same	Nurse, Med. Dept., U. S. Vols.	52.00		52.00
Invalid	do	Charles McAllister	William Wallace McCall	Private, Co. K, 109th Pa. Vol. Inf.	24.00	12.00	12.00
Widow	do	Martha M. McCall	Same	Private, Capt. Davis's Co., 1st Ga. Vols., Mex. war.	15.00	8.00	7.00
Invalid	do	James McMillan	Same	Col., 21st Ind. Inf.	50.00	30.00	20.00
Do.	do	Plum P. Miner	Same	Private, Co. B, 12th Ind. Inf.	24.00	12.00	12.00
Do.	do	Matthew P. Nale	Same	Private, Sabine Indian disturbances	8.00		8.00
Widow	do	Frances E. Pease	William R. Pease	Col., 117th N. Y. Inf., Capt. 7th U. S. Inf.	15.00		15.00

PENSIONS.

[illegible]

• Repealing a former special act obtained by fraud.

TABLE NO. 24.—Showing special acts granting pensions passed at the second session of the Fifty-Ninth Congress, etc.—Continued.

Class.	Date of special act.	Name of pensioner.	Name of soldier.	Rank and service.	Monthly rate.		Increase by reason of special act.
					By special act.	Prior to special act.	
Mother	May 7, 1898	Sarah Spangler	John Spangler	Private, Co. A, 9th Ohio Cav.	\$12.00	\$8.00	\$12.00
Widow	do	Mary Speier	William Speier	Capt., Co. I, 107th Ohio Vol. Inf., and Co. K, 107th O. V. I.	20.00		12.00
Mother	do	Anna M. Tate	Blair Tate	Private, Co. K, 26th Ohio Inf.	12.00		12.00
Widow	do	Margaret H. Townsend	Charles Townsend	Private, Co. H, 10th N. H. Inf.	12.00		12.00
Invalid	do	George G. Vogel	Same	Private, Co. C, 3d U. S. Inf., and Co. M, 9th Kans. Cav.	12.00		12.00
Widow	do	David C. Waring	Same	Private, Co. B, 8th N. Y. Inf., and Co. I, 23d N. Y. Inf.	24.00	12.00	12.00
Widow	do	Catherine Wilse	John Cummins	Private, Co. B, 50th Wis. Inf.	12.00		12.00
Invalid	May 14, 1898	William S. Adams	Same	Acting asst. surg., U. S. Vols.	17.00		17.00
Widow	do	Mary C. Case	Augusta Phillips	1st lieut., Co. D, 184th N. Y. Inf.	17.00		17.00
Do	do	Katherine L. Cushing	William B. Cushing	Commander, U. S. Navy	50.00	30.00	20.00
Invalid	do	W. L. Faxon	Same	Surgeon, 32d Mass. Inf.	12.00	6.00	6.00
Do	do	George W. Garrison	Same	Private, Co. I, 102d Pa. Inf.	30.00	12.00	18.00
Helpless child	do	Grace Gudgel	John Gudgel	Capt., Co. B, 112th Ill. Inf.	12.00		12.00
Widow	do	Callista Hadley	Smith Hadley	Private, Capt. Geo. Sanderson's Co., 27th U. S. Inf., war of 1812	16.00	12.00	4.00
Helpless child	do	Emory T. Hipple	William H. Hipple	Private, Co. D, 149th Pa. Inf.	12.00		12.00
Widow	do	Susan A. Huber	Jeremiah F. Huber	Capt. and C. S., U. S. Vols.	20.00	8.00	12.00
Do	do	Mary B. Bulings	Thomas M. Bulings	Col. 49th Pa. Inf.	30.00		30.00
Do	do	Martha Ann Hynes	Andrew B. Hynes	3d lieut., Co. C, 5th La. Vols., Mex. war	12.00	8.00	4.00
Invalid	do	Iteyaka, or One-Armed Jim.	Same	Indian scout, U. S. A., Sioux massacre, 1862	12.00		12.00
Do	do	James H. Kile	Same	1st lieut., Co. D, 1st Tenn. L. A.	24.00	17.00	7.00
Do	do	Frederick G. Moore	Same	Serg., Co. I, 105th N. Y. Vol. Inf.	20.00	12.00	8.00
Widow	do	Benjamin F. Moulton	Same	Acting asst. surg., U. S. Vols.	12.00		12.00
Nurse	do	Betsy B. Olin	Charles Olin	Private, Co. I, 7th N. H. Inf.	25.00	12.00	13.00
Widow	do	Ellen O'Rourke	Same	Nurse, Med. Dept., U. S. Vols.	8.00		8.00
Do	do	Hannah C. Pile	William A. Pile	Brig. gen., U. S. Vols.	30.00		30.00
Do	do	Louise M. Rice	Samuel A. Rice	Brig. gen., U. S. Vols., and col. 33d Iowa Inf.	50.00	30.00	20.00
Helpless child	do	William C. Ryan	George W. Ryan	Private, Co. B, 4th Tenn. Inf.	12.00		12.00
Do	do	Annie Saffell	James Saffell	Private, Co. G, 174th Ohio Inf.	12.00		12.00
Invalid	do	William D. Seamans	Same	Private, Co. L, 14th N. Y. H. A.	50.00	30.00	20.00
Widow	do	Eva Sealey	Oscar Sealey	Paymaster's steward, U. S. N.	16.00	8.00	8.00
Do	do	Ann M. Smith	Same	Private, Co. D, 48th Ind. Inf.	20.00	12.00	8.00
Widow	do	Hannah Lecher Stevenson	Andrew J. Smith	Brig. gen., U. S. A., and Mex. war	30.00	8.00	22.00
Invalid	do	Stimpson Everett Stillwell	John D. Stevenson	Brig. gen., U. S. Vols., and Mex. war	30.00	8.00	22.00
Do	do	Charles E. Taylor	Same	Scout and guide, U. S. A.	12.00		12.00
Do	do	Lafayette Tibbets	Same	Capt., Co. I, 4th Pa. Cav.	80.00		80.00
Widow	do	Janet Wemple	Edwin H. Wemple	Private, Co. C, 10th N. H. Vol. Inf.	8.00	12.00	18.00
Invalid	do	Lewis K. Whitmore	Same	Locomotive engineer, U. S. A.	25.00		25.00

Widow	do	Mary A. Wase	Peter Wase	Capt. Co. I, 14th Pa. Cav.	30.00	5.00	32.00
Nurse	do	Annie Wittemyer	James H. Work	Natgo, Med. Dep't, U. S. Vols.	12.00	12.00	24.00
Helpless child	do	Sallie Work	Same	Private, Co. E, 56th Iowa Vol. Inf.	30.00	14.00	44.00
Invalid	do	William H. H. Wright	Same	Private, Co. G, 56th Iowa Vol. Inf.	12.00	12.00	24.00
do	May 16, 1898	Michael H. J. Crouch	Same	Private, Co. M, 6th Pa. Cav.	34.00	12.00	46.00
Do	do	Ira Ingraham	Same	Surg., U. S. Vols.	25.00	8.00	33.00
Do	do	James F. McKinley	Same	1st Lieut. Co. K, 103th Pa. Inf.	4.00	8.00	12.00
Widow	do	Marcia C. Barnes	Charles Barnes	Col. 6th Pa. H. A. Vols. Mex. war.	30.00	12.00	42.00
Invalid	do	Michael Bassett	Same	Private, 1st Mich. 1st Prov. Kans. Mil.	12.00	8.00	20.00
Do	do	Henderson H. Boggs	Same	Private, Co. A, 3d Iowa Inf.	12.00	12.00	24.00
Helpless child	do	F. L. Botkin	Amos H. Botkin	Private, Co. G, 3d Iowa Cav.	30.00	6.00	36.00
Widow	do	Franklin L. Hamilton	Jesse B. Hamilton	Private, Co. A, 1st Wis. Cav.	12.00	7.00	19.00
Invalid	do	Myrtle L. Hall	Same	Sergeant, Co. D, 1st Conn. Cav.	34.00	17.00	51.00
Do	do	Russell R. King	Same	Private, Co. A, 8th Mich. Inf.	12.00	12.00	24.00
Do	do	William Taylor	Same	Private, Co. D, 14th Wis. Inf.	12.00	12.00	24.00
Helpless child	do	J. S. Waggener	Joseph E. Valentine	Private, Co. A, 97th Pa. Inf.	12.00	12.00	24.00
Father	do	J. S. Waggener	Joseph B. Waggener	Private, Co. I, and B, 3d Iowa Inf.	40.00	15.00	55.00
Invalid	do	George H. Baldwin	Same	Sergt., Co. F, 89th N. Y. Inf.	18.00	8.00	26.00
Do	do	George Barnes	Same	Private, Co. C, 87th and Co. I, 29th, Enrolled Mo. Mil.	50.00	12.00	62.00
Do	do	John X. Griffith	Same	Sergt., Co. A, 77th Ill. Vol. Inf.	50.00	8.00	58.00
Do	do	John B. Hays	Same	Capt. and bet. maj., 19th U. S. Inf.	30.00	12.00	42.00
Widow	do	Martha E. Hess	Florian Hess	Private, Capt. J. Berlin's Co., 11th Minn. Mil.	12.00	12.00	24.00
Do	do	Calvin P. Lynn	Same	Private, Co. G, 140th and D, 13th, Ill. Inf.	20.00	12.00	32.00
Do	do	John P. Thomas	Same	Private, Co. H, 30th Iowa Inf.	40.00	12.00	52.00
Helpless child	do	Florence N. Waldron	Samuel F. Waldron	Capt., Co. I, 33d N. J. Inf.	30.00	8.00	38.00
Invalid	do	C. S. Alvord	Same	Private, Co. D, 4th U. S. Inf.	24.00	12.00	36.00
Do	do	Benjamin Beach	Same	Lieut. Col., 1st Iowa Inf.	30.00	12.00	42.00
Do	do	Charles Beckwith	Same	Private, Co. I, 7th Mich. Cav. and Mex. war.	12.00	12.00	24.00
Widow	do	Mary A. Benjamin	Horatio H. Benjamin	Capt., Co. B, 138th Ohio Inf. and maj., 185th Ohio Inf.	12.00	12.00	24.00
Do	do	Olivia Betton	Thomas F. Betton	Surg., 1st U. S. Vet. Vol. Inf.	17.00	5.00	22.00
Invalid	do	John T. Brewster	Same	Sergt., Co. K, 141st Pa. Vol. Inf.	50.00	80.00	130.00
Do	do	Alonzo B. Charfield	Same	Private, Co. B, 33d Ill. Inf.	50.00	80.00	130.00
Father	do	Henry H. K. Elliott	Harry Elliott	Sergt., Co. D, 147th Pa. Vol. Inf.	13.00	12.00	25.00
Dependent child	do	Ida Emmott	Thomas Emmott	Private, 7th Battery, Mass. V. L. A., and 31st Co., 3d Batt'n V. R. C.	12.00	12.00	24.00
Invalid	do	William D. Foote	Same	Private, Co. G, 4th Pa. Cav.	30.00	12.00	42.00
Widow	do	Hettie Gresham	David G. Gresham	Private, Co. A, Vols., Ind. war of 1890	8.00	8.00	16.00
Invalid	do	Stdney J. Haro	Same	Private, Co. C, 96th N. Y. Inf. and H, 2d N. Y. Vet. Cav.	24.00	12.00	36.00
Do	do	Merlin C. Harris	Same	Capt., Co. C, 96th N. Y. Inf.	30.00	14.50	44.50
Do	do	William F. Haskell	Same	Lieut., Co. I, 14th Ind. Inf.	20.00	12.00	32.00
Widow	do	Emily A. Hauser	Charles W. Hauser	Sergt., Co. E, 64th N. Y. Vol. Inf.	12.00	12.00	24.00
Invalid	do	Charles Hoffman	Same	2d Lieut., Co. E, 78th Pa. Inf. and Mex. war.	34.00	17.00	51.00
Do	do	Gustavus A. Kindblade	Same	Private, Co. G, 4th Iowa Inf.	30.00	12.00	42.00
Do	do	James C. Kinkle	Same	Acting asst. surg., U. S. Army	12.00	12.00	24.00
Widow	do	Harriet M. Knowlton	William Knowlton	Maj., 26th Me. Vol. Inf.	35.00	12.00	47.00
Do	do	Adelaide H. Lamberton	Charles H. Kennon	Q. M. surgt., Co. D, 3d R. I. Cav.	12.00	4.00	16.00
Do	do	Rita Miller	Abraham Miller	Private, Co. E, 36th Ohio Vol. Inf.	12.00	8.00	20.00
Invalid	do	David Parker	Same	Private, Co. A, 4th N. Y. H. A.	17.00	17.00	34.00

a Inoperative; soldier died prior to passage of special act.

TABLE NO. 2A.—Showing special acts granting pensions passed at the second session of the Fifty-fifth Congress, etc.—Continued.

Class.	Date of special act.	Name of pensioner.	Name of soldier.	Rank and service.	Monthly rate.		Increase by reason of special act.
					By special act.	Prior to special act.	
Widow	June 8, 1898	Julia L. Roberts	John M. Doty	Acting asst. surg., U. S. Vols	\$17.00	.....	\$17.00
Do	do	Mary E. Taylor	William H. Taylor	1st lieutenant, Capt. Goodwyn's Co., Ala. Vols., Greek war.	8.00	.....	8.00
Helpless child	do	Zolman Tyrrell	Lewis R. Tyrrell	Private, Co. A, 1st N. Y. Eng.	12.00	.....	12.00
Invalid	do	George W. Van Vleet	Same	1st lieutenant, Co. H, 106th Pennsylvania Inf.	24.00	\$17.00	7.00
Do	do	George W. D. Wade	Same	Private, Co. A, 1st Ill. Vols., Mex. war	20.00	.....	8.00
Widow	June 10, 1898	Nancy G. Allabach	Peter H. Allabach	Col., 131st Pa. Inf.	30.00	8.00	22.00
Invalid	do	Lewis D. Baker	Same	Private, Co. G, 14th N. Y. H. A.	20.00	12.00	8.00
Do	do	William A. Beckford	Same	1st lieutenant, Co. F, 8th N. H. Vol. Inf.	50.00	90.00	20.00
Nurse	do	Jennie E. Burch	Same	Nurse, Med. Dept., U. S. Vols	12.00	.....	12.00
Invalid	do	Philip F. Castleman	Same	Q. M. agent, Oregon Vols., Oregon Ind. war, 1855-56	15.00	.....	15.00
Do	do	Peter Daly	Same	Private, Co. K, 1st U. S. Inf., and G. 20th U. S. Inf.	12.00	6.00	6.00
Do	do	George L. Durbin	Same	Corpl., Co. G, 146th, and Co. I, 134th Ind. Inf.	30.00	12.00	18.00
Do	do	Daniel G. George	Same	Private, Co. D, 1st Mass. Cav., and coxswain U. S. Navy.	30.00	12.00	18.00
Widow	do	Lucia A. Hynes	John R. Hynes	Capt. and asst. Q. M., 24th U. S. Inf.	17.00	.....	17.00
Invalid	do	Charles H. Johnson	Same	Private, Co. E, 1st N. H. H. A.	30.00	12.00	18.00
Widow	do	Mary M. Macauley	Daniel Macauley	Brig. gen., U. S. Vols., and col. 9th U. S. Vet. Vol. Inf.	30.00	.....	30.00
Invalid	do	Andrew C. Mensch	Same	Capt., Co. E, 209th Pa. Inf.	30.00	20.00	10.00
Do	do	Benjamin L. Nolan	Same	Private, Co. D, 8th Mass. Inf., and Co. G, 3d U. S. Cav.	12.00	.....	12.00
Do	do	William H. Oliver	Same	Private, Co. C, 104th Pa. Vol. Inf.	30.00	12.00	18.00
Do	do	Oscar A. Palmer	Same	Private, Co. F, 11th Ohio Vol. Inf.	12.00	6.00	6.00
Do	do	Joseph Porter	Same	Private, Co. K, 6th N. Y. H. A.	30.00	30.00	(a)
Do	do	Richard T. Selizer	Same	Private, Co. F, 40th Mo. Vol. Inf.	8.00	.....	8.00
Widow	do	Maria Somerlat	Valentine Somerlat	Private, Co. A, 20th Ind. Vol. Inf.	12.00	.....	12.00
Invalid	do	Edward Stanley	Same	Private, Co. G, 12th Me. Vol. Inf.	24.00	8.00	16.00
Do	do	Simeon Stevens	Same	Private, Co. A, 15th N. H. Vol. Inf.	20.00	8.00	12.00
Do	do	Amos Webster	Same	Bvt. lieutenant, 1st Mass. Vol. Inf.	30.00	.....	30.00
Widow	do	Susan D. Yates	Arthur Reid Yates	Capt., U. S. Navy	50.00	30.00	20.00
Do	do	Bettie Hord Brown	Orlando Brown	Adj., 2d Ky. Inf., and Lieut. Col., 14th Ky. Inf.	30.00	17.00	13.00
Do	do	Mary E. Chamberlin	Lowell A. Chamberlin	Capt., Batt. V, 1st U. S. Art.	30.00	20.00	10.00
Invalid	do	Thomas Edsall	Same	Private, Co. E, 9th Ill. Cav.	12.00	.....	12.00
Widow	do	Adonis Huard	Hypolite Huard	Private, Capt. Manberet's Batt'n, La. V. L. A., Mex. war.	8.00	.....	8.00
Invalid	do	Halbert E. Paine	Same	Brig. gen., U. S. A., and Col., 4th Wia. Inf.	50.00	30.00	20.00
Do	do	Peter Castle	Same	Corp. Co. D, 4th N. Y. Prov. Cav., and D. 1st N. Y. Mtd. Rifles.	25.00	8.00	17.00
Do	do	Samuel B. Davis	Same	Corpl., Co. C, 18th Ind. Inf.	50.00	36.00	14.00
Do	do	Price W. Hawley	Same	Private, Co. B, 73d, and Co. A, 29th Ind. Inf.	24.00	12.00	12.00

do	do	Lowell H. Hopkinson	Same	James Clifford	James Clifford	Sergt., Co. A, 57th and Co. A, 59th Mass. Inf.	50.00	12.00	38.00
do	do	Alfred D. Johnson	Same	Same	William Stephenson Smith	Private, Co. A, 46th Ohio Inf.	24.00	12.00	12.00
Do.	do	Clara A. Short	Same	Same	Edward Start	Capt. Co. F, 11th Pa. Cav.	30.00	12.00	30.00
Widow	do	William Tompkins	Same	Same	Same	Private, Co. F, 11th Pa. Cav.	50.00	12.00	31.00
Invalid	do	Henry H. Tucker	Same	Same	Same	1st Lieut., Co. B, 16th Ill. Inf. and Indian scout, U. S. A.	25.00	12.00	12.00
Do.	do	Catherine Clifford	James Clifford	James Clifford	Same	Private, 26th Batt'y, Ind. L. A.	25.00	12.00	12.00
Widow	June 22, 1898	William Stephenson Smith	Same	Same	Same	Private, Co. L, 11th Tenn. Vol. Cav.	12.00	12.00	12.00
Invalid	do	Edward Start	Same	Same	Same	Private, Co. C, 1st Wash. Ter. Inf. and G, 9th U. S. Inf.	30.00	12.00	16.00
Do.	do	Blanche E. Barlow	A. C. Barlow	A. C. Barlow	Same	Surg., 4th W. Va. Inf. and 62d Ohio Inf.	17.00	8.00	9.00
Do.	do	Lucinda Booth	Wiley Booth	Wiley Booth	Same	Private, Hookaby's Co. Ga. Mil., war of 1812.	20.00	12.00	8.00
Do.	do	Clarissanda L. McGuire	James E. McGuire	James E. McGuire	Same	Capt., Co. F, 51st Ind. Inf. and Mex. war.	20.00	8.00	12.00
Invalid	do	Carlton W. Muzzy	William Page	William Page	Same	Landman, U. S. S. Minnesota.	12.00	8.00	4.00
Widow	do	Mary L. Page	Robert Edwin Rodgers	Robert Edwin Rodgers	Same	Private, Co. I, 83d Ill. Inf.	72.00	80.00	42.00
Invalid	do	Eljah N. Parkhurst	John Barger	John Barger	Same	Private, Co. A, 9th Ind. Cav.	25.00	95.00	95.00
Widow	do	Clara R. Rodgers	John C. Brown	John C. Brown	Same	Maj., 4th Ohio Cav. and Co. K, 4th Ohio Cav.	12.00	12.00	12.00
Mother	do	Nancy Barger	Same	Same	Same	Private, Co. D, 46th Pa. Inf. and Co. H, 4th Pa. Inf.	12.00	12.00	12.00
Widow	June 28, 1898	John C. Brown	Same	Same	Same	Sergt., Co. D, 84th N. Y. Inf., and 1st Lieut., Co. H, 5th N. Y. Inf.	30.00	17.00	13.00
Invalid	do	Paul Carr	Same	Same	Same	Landman, U. S. S. Princeton and New Ironsides.	30.00	12.00	18.00
Do.	do	Jesse O. Davy	George F. Kutz	George F. Kutz	Same	Private, Co. B, 39th and E, 16th Ohio Inf.	12.00	12.00	12.00
Do.	do	Rebecca E. Kutz	Same	Same	Same	Q. M. sergt., 17th Ohio Inf.; private, Co. F, 17th Ohio Inf.	12.00	12.00	12.00
Do.	do	Levi R. Long	Same	Same	Same	Private, Co. I, 17th Pa. Cav.	40.00	80.00	10.00
Do.	do	Thomas Madden	Same	Same	Same	Corpl., Co. H, 92d N. Y. Inf.	8.00	6.00	8.00
Do.	do	Charles E. Mann	Same	Same	Same	Sergt., Co. H, 2d Mass. Cav.	20.00	12.00	2.00
Do.	do	John H. Mullen	Same	Same	Same	Capt., Co. C, 12th Conn. Inf., and sergt. maj., 12th Conn. Inf.	8.00	12.00	8.00
Do.	do	George W. Palmer	Same	Same	Same	Private, Co. B, 10th U. S. Inf. Mex. war.	20.00	12.00	8.00
Do.	do	Susan M. Seesford	Thomas J. Martin	Thomas J. Martin	Same	Private, Co. D, 2d Batt'n, D. C. Inf.	12.00	12.00	16.00
Invalid	do	Samuel A. Smith	Same	Same	Same	Private, Co. C, 84th Ill. Inf.	30.00	12.00	12.00
Widow	do	Julia E. Warner	Hans B. Warner	Hans B. Warner	Same	Private, Co. G, 37th W's. Inf.	12.00	12.00	12.00
Invalid	do	William J. Williams	Same	Same	Same	Private, Co. G, 6th Del. Inf.	8.00	12.00	8.00
Do.	do	Joseph C. Berry, alias White.	Same	Same	Same	Private, Co. K, 8th Iowa Inf.	50.00	80.00	30.00
Do.	July 1, 1898	John A. Bingham	Same	Same	Same	Maj. and J. A. Gen., U. S. Vols.	25.00	25.00	25.00
Widow	do	Mary Brogan	Francis Brogan	Francis Brogan	Same	Corpl., Co. F, 2d U. S. Art.; D, 2d Cal. Cav., and Ordnance Corps, U. S. A.	14.00	12.00	2.00
Invalid	do	William Christenberry	Same	Same	Same	Private, Capt. Miller's Co., Tenn. Vol., Ind. war.	20.00	8.00	12.00
Do.	do	George H. Glivens	Same	Same	Same	Private, Co. D, 1st Ky. Cav., Mex. war.	18.00	12.00	6.00
Do.	do	Joseph R. Mathers	Same	Same	Same	Private, Co. A, 3d W. Va. Inf.	12.00	12.00	12.00
Do.	do	Lauritz Olsen	Same	Same	Same	Private, 2d Batt'y, Minn. L. A.	40.00	12.00	28.00
Do.	do	George W. Osborn	Same	Same	Same	Private, Co. C, 54th Ohio Inf.	24.00	12.00	12.00
Do.	do	Frank Rockwith	Same	Same	Same	Surgeon's steward, U. S. S. Arletta.	12.00	12.00	12.00
Do.	do	William L. Smithson	Same	Same	Same	Private, Co. D, 8th Tenn. Vols., Mex. war.	24.00	12.00	12.00
Do.	do	Junius Alexander	Same	Same	Same	Private, Co. F, 1st U. S. C. Inf. and F, 9th La. C'd A. Inf.	12.00	12.00	12.00
Do.	July 7, 1898	Ephraim C. Baldwin	Same	Same	Same	Lieut., Coe. Rand D, 1st Cal. Cav., and E, 1st Cal. Cav.	25.00	15.00	20.00
Do.	do	Susan I. Barrows	Same	Same	Same	Private, Co. E, 8th Me. Inf.	12.00	12.00	12.00
Helpless child	do		Same	Same	Same				

a Inoperative; special act confers no benefit.

TABLE NO. 24.—Showing special acts granting pensions passed at the second session of the Fifty-fifth Congress, etc.—Continued.

Class.	Date of special act.	Name of pensioner.	Name of soldier.	Rank and service.	Monthly rate.		Increase by reason of special act.
					By special act.	Prior to special act.	
Invalid	July 7, 1898	Samuel H. Beckwith.	Same	Private, Co. F, 11th Ill. Inf. and Tel. Corps, Q. M. Dept., U. S. Vols.	\$30.00	\$12.00	\$18.00
Stepfather	do	John R. Bevan.	Edward L. Bowden	Private, Co. G, 1st Me. H. A.	12.00	12.00	12.00
Invalid	do	Joel Blackman.	Same	Private, Co. K, 4th N. H. Vol. Inf.	30.00	12.00	18.00
Widow	do	Theresa Bonnavau	John B. Bonnavau	Private, La. Vols., Mex. war	8.00	8.00	8.00
Invalid	do	Patrick Breen	Same	Sergt., Cos. A. and D, 21st U. S. Inf., and G, 1st U. S. Cav.	12.00	12.00	12.00
Do.	do	Foster C. Carl.	Same	Private, Co. I, 1st N. Y. Mtd. Rifles.	18.00	18.00	18.00
Do.	do	Abraham T. Casey.	Same	Private, Co. H, 1st Ill. Cav.	20.00	12.00	8.00
Helpless child	do	Mary Hannah Clark.	John W. Clark	Sergt., Co. B, 8th Mass. V. Inf., and A, 4th Mass. H. A.	12.00	12.00	12.00
Widow	do	Mary C. Cook.	Lewis G. Cook	Mat. and Acting Master, U. S. Navy	20.00	12.00	8.00
Invalid	do	Newton W. Cooper	Same	Sergt., Co. H, 3d Pa. H. A., and C, 20th V. R. C.	50.00	12.00	38.00
Do.	do	Alphonzo O. Drake	Same	Private, Co. E, 2d R. I. Vol. Inf.	20.00	12.00	8.00
Do.	do	Alvah A. Eaton	Same	Private, Co. A, 28th N. Y. Inf.	24.00	12.00	12.00
Widow	do	Margaret Ferriter	Patrick Ferriter	Private, Co. F, 24th Wis. Inf.	8.00	8.00	8.00
Invalid	do	Michael J. Fogerty	Same	Private, Co. F, 12th U. S. Inf.	50.00	36.00	14.00
Widow	do	Henrietta Fowler	Jesse Fowler	Private, Ga. Vols., Ind. war of 1836.	8.00	8.00	8.00
Nurse	do	Martha J. Freer	Same	Nurse, Med. Dept., U. S. Vols.	12.00	12.00	12.00
Mother	do	Ann Gibbons	John J. Gibbons	Capt., Co. C, 62d Ill. Inf.	20.00	12.00	8.00
Invalid	do	Jeremiah Hackett.	Same	Private, Co. C, 4th Mass. H. A.	30.00	12.00	18.00
Do.	do	James C. Hervey	Same	Capt., Co. I, 63d Ind. Inf.	12.00	6.00	6.00
Do.	do	Henry Hinkley	Same	Private, Co. G, 5th Vt. Inf.	25.00	25.00	25.00
Do.	do	James E. Jones	Same	Bvt. col. and A. Q. M. U. S. Vols.	50.00	30.00	20.00
Widow	do	Fannie Kantz	August V. Kantz	Col., 8th U. S. Inf. and 2d Ohio Cav.	12.00	12.00	12.00
Helpless child	do	Mary E. Kline	John Kline	Capt., Co. H, 13th Pa. Cav.	16.00	10.00	6.00
Invalid	do	John N. Landon	Same	Private, Co. H, 135th Pa. Inf., and Co. K, 15th Pa. Inf.	50.00	24.00	26.00
Do.	do	William Manley	Same	Private, Co. L, 16th Mich. Inf.	30.00	30.00	30.00
Widow	do	Cornelia M. Mason.	John S. Mason	Col., 9th U. S. Inf. and 4th Ohio Inf.	12.00	12.00	12.00
Helpless child	do	Jacob Miller.	Abraham Miller	Private, Co. E, 36th Ohio Inf.	12.00	8.00	4.00
Invalid	do	Warren W. Morgan	Same	Private, Co. G, 8th U. S. Inf.	30.00	12.00	18.00
Do.	do	William B. Murray	Same	Private, Co. I, 10th Tenn. Inf.	12.00	12.00	12.00
Do.	do	William J. Murray	Same	Telegraph Corps, U. S. Vols.	12.00	12.00	12.00
Nurse	do	Ellen E. Nash, formerly Moss.	Same	Nurse, Med. Dept., U. S. Vols.	12.00	12.00	12.00
Widow	do	Beile Peter	Henry W. Peter	Acting asst. surg., U. S. Vols.	12.00	12.00	12.00
Invalid	do	George D. Phinney	Same	Private, Co. A, 7th Wis. Inf.	36.00	30.00	6.00
Helpless child	do	Pauline Robbins.	Elisha Robbins	Private, Co. I, 18th N. Y. Inf.	12.00	12.00	12.00
Invalid	do	Barney Smith	Same	Private, Co. E, 10th Tenn. Inf.	12.00	12.00	12.00
Do.	do	Almon Stuart	Same	Private, Co. I, 9th Ind. Inf.	30.00	12.00	18.00
Do.	do	Edson Sullivan	Same	Private, Co. C, 1st N. H. H. A.	24.00	12.00	12.00

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Widow	do	Matilda Wael	Fordman Wael	Private, Co. H, 36th Wis. Vol. Inf.	8.00	5.50	8.00
Invalid	do	Mary E. Walker	do	A. A. (contract) surr., U. S. Vols.	12.00	12.00	12.00
Widow	do	Mary A. Watts	do	Private, Co. G, 1st Ar. Vidette Cav.	20.00	12.00	20.00
Invalid	do	Edward R. Young	do	Private, Battery H, 1st U. S. Art	20.00	12.00	20.00
do	do	James C. Young	do	Private, Co. C, 22d Ill. Inf.	12.00	8.00	12.00
Nurse	July 8, 1898	Addie L. Ballou	do	Private, Co. C, 22d Ill. Inf.	15.00	8.00	15.00
Widow	do	John H. Boyd	do	Nurse, Med. Dept., U. S. Navy	80.00	12.00	80.00
Invalid	do	James S. Bassett	do	Lieut. commander, U. S. Navy	40.00	8.00	40.00
do	do	James S. Chapman	do	Private, Co. C, 8th Iowa Inf., and Co F, 1st Iowa Cav.	25.00	8.00	25.00
Widow	do	Diana Clark	do	Private, Co. B, 5th Batt'n Ohio Vol. Cav.	8.00	8.00	8.00
do	do	Cassius M. Clay, sr	do	Capt. Co. B, 30th Iowa Inf.	12.00	8.00	12.00
Invalid	do	John Connolly	do	Private, Co. A, 69th N. Y. Vol. Inf.	12.00	8.00	12.00
Father	do	Charles Clark	do	Private, Co. A, 69th N. Y. Vol. Inf.	12.00	8.00	12.00
do	do	Thomas Connolly	do	Private, Co. A, 69th N. Y. Vol. Inf.	12.00	8.00	12.00
do	do	Moses C. C.	do	Private, Co. A, 69th N. Y. Vol. Inf.	12.00	8.00	12.00
do	do	Charles A. Dunham	do	Private, Co. D, U. S. Engineers, and Co. K, 8th Mich. Inf.	12.00	8.00	12.00
do	do	James E. Eaton	do	Private, Co. D, U. S. Engineers, and Co. K, 8th Mich. Inf.	12.00	8.00	12.00
Invalid	do	James E. Eaton	do	Private, Co. D, U. S. Engineers, and Co. K, 8th Mich. Inf.	12.00	8.00	12.00
do	do	Armenia H. Evans	do	Private, Co. D, U. S. Engineers, and Co. K, 8th Mich. Inf.	12.00	8.00	12.00
Widow	do	Virginia C. Flea of	do	Private, Co. D, U. S. Engineers, and Co. K, 8th Mich. Inf.	12.00	8.00	12.00
do	do	Charles W. Harrington	do	Private, Co. D, U. S. Engineers, and Co. K, 8th Mich. Inf.	12.00	8.00	12.00
Invalid	do	Minam W. Kenney	do	Private, Co. D, U. S. Engineers, and Co. K, 8th Mich. Inf.	12.00	8.00	12.00
do	do	Herbert W. Leach	do	Private, Co. D, U. S. Engineers, and Co. K, 8th Mich. Inf.	12.00	8.00	12.00
Widow	do	Mary McLaughlin	do	Private, Co. D, U. S. Engineers, and Co. K, 8th Mich. Inf.	12.00	8.00	12.00
Invalid	do	Prudence A. Shaw	do	Private, Co. D, U. S. Engineers, and Co. K, 8th Mich. Inf.	12.00	8.00	12.00
do	do	Olive H. South	do	Private, Co. D, U. S. Engineers, and Co. K, 8th Mich. Inf.	12.00	8.00	12.00
Nurse	do	Mary Ann Sullivan	do	Private, Co. D, U. S. Engineers, and Co. K, 8th Mich. Inf.	12.00	8.00	12.00
Mother	do	Felix Talt	do	Private, Co. D, U. S. Engineers, and Co. K, 8th Mich. Inf.	12.00	8.00	12.00
Invalid	do	Alden B. Thompson	do	Private, Co. D, U. S. Engineers, and Co. K, 8th Mich. Inf.	12.00	8.00	12.00
do	do	George S. Wilton	do	Private, Co. D, U. S. Engineers, and Co. K, 8th Mich. Inf.	12.00	8.00	12.00
do	do	John N. Wiley	do	Private, Co. D, U. S. Engineers, and Co. K, 8th Mich. Inf.	12.00	8.00	12.00
do	do	James M. Shane	do	Private, Co. D, U. S. Engineers, and Co. K, 8th Mich. Inf.	12.00	8.00	12.00
Widow	do	James M. Shane	do	Private, Co. D, U. S. Engineers, and Co. K, 8th Mich. Inf.	12.00	8.00	12.00
Grand total b					8,498.00	2,911.50	5,586.50

a Inoperative, special act confers no benefit.
b Exclusive of four Inoperative acts and one act repealing a prior special act.

TABLE NO. 24.—Showing special acts granting pensions passed at the second session of the Fifty-fifth Congress, arranged according to class, date of approval, name of beneficiary, and name, rank, and service of soldier upon whose service pension is based, together with monthly rate by special act, monthly allowance prior to passage of special act, and increase in each case by reason of passage of special act.

Class.	Date of special act.	Name of pensioner.	Name of soldier.	Rank and service.	Monthly rate.		Increase by reason of special act.
					By special act.	Prior to special act.	
Widow	Feb. 14, 1898	Emily E. Atherton	Benjamin F. Atherton	Capt., Co. C, 1st Me. H. A.	\$20.00		\$20.00
Do	do	Mary W. C. Burgess	Benjamin F. Burgess	Acting asst. surg., U. S. A.	17.00		17.00
Do	do	Ella D. Cross	Richard E. Cross	Private, Co. 5th N. H. Vols	30.00		30.00
Invalid	do	Benjamin F. Tuck	Same	Private, Co. E, 19th Mass. Vol. Inf.	30.00	\$12.00	18.00
Mother	Mar. 3, 1898	Marletta Hayes	Watson Hayes	Private, Co. E, 19th Conn. Inf.	12.00		12.00
Invalid	Mar. 5, 1898	John A.resh	Same	Capt., Co. E, 28th Ohio Inf.	30.00		30.00
Widow	do	Katharine Brown	James Brown	Capt., Co. E, 28th Ohio Inf.	12.00	17.00	13.00
Do	do	Margaret C. Calhoun	James Calhoun	Capt., Co. E, 28th Ohio Inf.	12.00	8.00	4.00
Invalid	do	John V. Conway	Same	Lieut., 7th U. S. Cav.	30.00	17.00	13.00
Do	do	John V. Dodd	Same	Serg., Co. F, 24th Ill. Vols. (Mex. war)	30.00	12.00	18.00
Widow	do	John L. Fagg	John A. Fagg	Capt., Co. A, 24th Ill. Vols. (Mex. war)	30.00	12.00	18.00
Do	do	Martin Frank	William Frank	Lieut. col., N. C. Vols. (Mex. war)	12.00	8.00	4.00
Invalid	do	John H. Hainaway	Same	Private, Capt. Little's Co., Ind. war of 1818	17.00		17.00
Foster-mother	do	Rachel Kern	James M. Allen	Acting asst. surg., 12th Indian Brigade U. S. A.	12.00		12.00
Invalid	do	Charles A. Nasro	Same	Corp., Co. D, 12th Ind. Res. Co., Ind. war of 1818	50.00	17.00	33.00
Do	do	William H. Palmer	Same	Private, Co. A, 6th Wis. Inf.	30.00	12.00	18.00
Widow	do	Margaret Rowsell	George Rowsell	Private, Co. F, and D, 4th U. S. Inf.	8.00		8.00
Do	do	William H. Morgan	Edward B. Fowler	Col. and Postmaster Genl., H. A.	30.00		30.00
Invalid	Mar. 14, 1898	William H. Morgan	Same	Private, Co. F, 12th Ind. Res. Co., Ind. war of 1818	30.00	17.00	13.00
Do	do	Joshua Parker	Same	Chief engin., U. S. Navy	40.00	24.00	16.00
Widow	do	Emeline C. Sewell	George Sewell	Capt., Co. K, 129th Ind. Inf.	30.00		30.00
Invalid	do	William N. Ashburn	Same	Acting master, U. S. Navy	30.00	24.00	6.00
Do	do	William N. Wells	Same	Acting master, U. S. Navy	30.00	10.00	20.00
Widow	do	Esther Williams	Gilbert M. Williams	Seaman, U. S. Navy	12.00	8.00	4.00
Invalid	Mar. 19, 1898	James Eganston	Same	Private, Capt. James Smith's Co., Tex. Mtd. Vols. (Mex. war)	12.00		12.00
Do	do	Riley W. Pierce	Same	Private, Capt. James Smith's Co., Tex. Mtd. Vols. (Mex. war)	8.00		8.00
Do	do	John A. Worwick	Same	Private, Co. H, 18th Wis. Inf.	20.00	8.00	12.00
Widow	Mar. 23, 1898	Caroline W. Abney	Mathew W. Abney	Private, Capt. Denny's Co., S. C. Vols., Ind. wars, 1832-1842	12.00	8.00	4.00
Invalid	do	Napoleon B. Breedlove	Same	Private, Co. G, 4th La. Vols., Mex. war	20.00	12.00	8.00
Widow	do	Florence W. Buekirk	John W. Buekirk	Corp., Co. G, 49th Iowa Inf.	20.00	8.00	12.00
Do	do	Martha S. Harlee	William W. Harlee	Mad., S. C. Mil., Indian wars from 1832 to 1842	12.00	8.00	4.00
Invalid	do	William D. Lamb	Same	Acting asst. surg., U. S. A.	17.00		17.00
Widow	do	Cornelia I. Skiles	John W. Skiles	Mad., 88th Ohio Inf.	25.00	8.00	17.00
Invalid	Mar. 31, 1898	John J. Bentwright	Same	Private, Co. I, 24th Ohio Inf.	30.00	14.00	16.00
Do	do	Joseph V. Bowls	Same	Sergt., Co. D, 14th N. H. Inf.	30.00	8.00	22.00
Widow	do	Mary F. Hawley	John B. Hawley	Capt., Co. H, 46th Ill. Inf.	20.00		20.00
Nurse	do	Mary Hayne	Same	Nurse, Med. Dept., U. S. Vols.	12.00		12.00

Invalid	do	Orlando J. Hopkins	Same	Capt., commissary of vols., Co. A, 69th Ohio Inf	30.00	12.00	18.00
Do	do	Isabel Phillips	Same	Serjt., Co. D, 18th Wis. Inf	30.00	12.00	18.00
Nurse	do	Esther H. Rollins	Same	Nurse, Med. Dept., U. S. Vols	12.00	12.00	12.00
Invalid	Apr 11, 1898	Enoch C. Adams	Same	Capt., Co. D, 1st U. S. Vol. Inf. and Co. D, 2d N. H. Inf	50.00	24.00	26.00
Do	do	John A. Anderson	Same	Private, Heavy I. 5th U. S. Artillery and Co. A, 61st Ind. Inf	17.00	12.00	6.00
Do	do	James H. Blakeman	Same	Private, Co. F, 166th Ohio Inf	30.00	6.00	24.00
Do	do	Roland A. Browning	Same	Private, Co. I, 4th Tenn. Vols. (Mex. war)	30.00	12.00	8.00
Do	do	John N. Bruce	Same	Capt., Co. E, 14th N. H. Inf	30.00	12.00	38.00
Do	do	Francis M. Bruner	Same	Capt., Co. A, 7th U. S. C. Infantry	50.00	24.00	26.00
Do	do	William H. Byrum	Same	Private, Co. E, 7th Ind. Legion	10.00	10.00	10.00
Do	do	Sophia J. Chilcott	Same	Private, Co. I, 13th Me. Inf	12.00	12.00	12.00
Widow	do	George D. Cook	James C. Chilcott	Serjt., Co. K, 110th Ohio Inf	30.00	30.00	18.00
Invalid	do	William P. Cooper	Same	Private, Co. A, 1st Tenn. Inf	50.00	17.00	33.00
Do	do	Sarah E. Cotton, formerly Thomas, Conn.	Same	Nurse, Med. Dept. U. S. Vols	12.00	12.00	12.00
Nurse	do	Bernard Dunn	Same	Private, Co. A, 2d Iowa Cav	24.00	10.00	14.00
Invalid	do	Robert G. English	Same	Private, Capt. Walker's Co. Ky. Vols., Ind. wars 1832-1842	8.00	8.00	8.00
Do	do	Mary J. Hart	Abel R. Pearson	Private, Co. A, 79th Ind. Inf	12.00	12.00	12.00
Widow	do	Alexander E. Ingraham	Andrew J. Herd	Lieut. col., 14th Ky. Cav. and D. 7th Ky. Inf	30.00	8.00	22.00
Invalid	do	Milton Iserman	Same	Private, Co. I, 21st Ohio Inf	30.00	16.00	14.00
Do	do	Thomas Lane	Same	Private, unassigned, 32d N. J. Inf	24.00	12.00	12.00
Do	do	Weltha Post Leggett	Mortimer D. Leggett	Private, Capt. Wm. Moore's Co., Ill. Mil., Sac and Fox Ind. War	8.00	8.00	8.00
Widow	do	Barbara Miller	John Miller	Maj. gen., U. S. Vols	50.00	8.00	50.00
Minor	do	James B. Rawlins	John A. Rawlins	Private, Co. G, 142d N. Y. Inf	12.00	8.00	4.00
Do	do	Henry F. Rice	Same	Maj. gen., U. S. A., brig. gen. and A. A. gen., U. S. Vols	30.00	30.00	30.00
Invalid	do	Carry H. Russell	Same	1st Lieut., Co. B, 17th U. S. Inf	30.00	12.00	18.00
Widow	do	Minerva Sample	Kirk J. Sample	1st Lieut., Co. G, 29th Ohio Inf	30.00	12.00	18.00
Invalid	do	Charles C. Short	Same	Acting asst. surg., U. S. Vols	17.00	17.00	17.00
Widow	do	Sarah M. Spyker	Leonidas P. Spyker	Private, Co. D, 21st N. Y. Inf	30.00	12.00	18.00
Invalid	do	Charles L. Stephens	Same	Ensign, Ala. Vols., Ind. War of 1836	8.00	8.00	8.00
Widow	do	Elizabeth M. Tuzay	Solomon P. Tunny	Private, Co. L, 4th Prov. Enr. Mo. Mil	40.00	40.00	40.00
Invalid	do	Isaac B. Vail	Same	2d serjt., Co. K, 3d Ind. Inf. (Mex. war)	30.00	8.00	8.00
Do	do	Elisha M. Luckett	Same	Private, Co. C, 18th Mass. Inf	30.00	16.00	14.00
Widow	do	Mary Vockey, alias Bird	Theodore Vockey, alias Bird	Lieut., Co. B, 2d Pa. Vol. Inf., Mex. war	25.00	15.00	(a)
Do	do	Mary E. Wallick	William Wallick	Serjt., Co. H, 1st U. S. Dragoons (Mex. war)	8.00	8.00	8.00
Invalid	do	William Warner	Same	Capt., Co. G, 51st Ind. Inf	20.00	8.00	12.00
Do	do	William H. Webster	Same	Private, Co. I, 11th Wis. Inf	50.00	12.00	38.00
Widow	do	Della E. Woodward	Same	1st Lieut., Co. I, 8th N. Y. Cav	50.00	30.00	20.00
Do	do	Carrie F. Bissell	Harmon D. Bissell	Col. 2d V. R. C. and maj., 1st Minn. Inf	25.00	25.00	25.00
Do	Apr 13, 1898	Anna E. Botsford	Eli W. Botsford	Q. M. 83d Ill. Inf	80.00	17.00	13.00
Invalid	do	William L. Grigsby	Same	Maj., 16th Ohio Inf. and Mex. war	12.00	8.00	4.00
Widow	do	Ann M. Madden	Harry O. Madden	Private, Co. E, 17th Iowa Inf	36.00	12.00	24.00
Mother	do	Harriet R. Matlack	Joseph Matlack	Corpl., Co. F, 2d Mass. Inf	8.00	8.00	8.00
Widow	do	Susan A. Paddock	Joseph W. Paddock	Serjt., Co. H, 12th N. J. Inf	8.00	8.00	8.00
Do	do			Acting adj. gen. and maj., U. S. Vols. and capt., Co. K, 1st Nebr. Inf	25.00	25.00	25.00

a Inoperative; soldier died prior to passage of special act.

TABLE NO. 24.—Showing special acts granting pensions passed at the second session of the Fifty-fifth Congress, etc.,—Continued

Class.	Date of special act.	Name of pensioner.	Name of soldier.	Rank and service.	Monthly rate.		Increase by reason of special act.
					By special act.	Prior to special act.	
Widow	Apr. 13, 1898	Caroline A. Slocum	Willard Slocum	Lieut. col., 120th Ohio Inf.	\$30.00	.....	\$30.00
Do	do	Olevia S. W. Schurn	John H. Dale	Private, Co. C, 13th Tenn. Cav.	12.00	.....	12.00
Invalid	do	Robert P. Wild	Same	Private, Co. B, 2d N. C. Mid. Inf.	20.00	\$12.00	8.00
Widow	Apr. 15, 1898	Leahella G. Daniels	Charles W. Barry	Private, Co. B, 108th N. Y. Vol. Inf.	8.00	.....	8.00
Do	do	Ellen Day	Milton T. Daniels	Private, Co. A, 1st Mass. Cav.	20.00	12.00	8.00
Stepmother	do	Sarah A. Denny	Albert L. Day	Private, Co. I, 5th Ohio Inf.	12.00	.....	12.00
Nurse	do	Samuel F. Fowler	Same	Nurse, Med. Dept. U. S. Vols.	20.00	.....	20.00
Invalid	do	Nicholas Gardner	Same	Private, Co. A, 1st U. S. Inf.	20.00	8.00	12.00
Do	do	James J. Gibbs	Same	Private, Co. D, 101st Ind. Inf. and 19th Baty., Ind. L. A.	50.00	17.00	33.00
Do	do	Joseph P. Harmon	Same	Private, Capt. G. White's Co., Natl. Gds., E. Tenn.	10.00	.....	10.00
Nurse	do	Nancy Hollenback, formerly Boaz nee Valey.	Same	Private, Co. B, 7th Me. Inf. and K, 5th Me. Inf.	30.00	12.00	18.00
Minor	do	Emily J. Miller	Robert B. Miller	Nurse, Med. Dept., U. S. Vols.	12.00	.....	12.00
Widow	do	Cora L. Robinson	Leonidas L. Robinson	Private, Co. C, 109th N. Y. Vol. Inf.	15.00	.....	15.00
Invalid	do	Elwin A. Scutt	Elwin A. Scutt	3d Lieut., Rev. Cutter Service, Icy Bay (Alaska), Exp., May, 1891.	16.00	.....	16.00
Do	do	Daniel J. Smith	Same	Private, Co. I, 151st N. Y. Vol. Inf.	12.00	8.00	4.00
Do	do	Jerome A. Stanton	Same	Private, Capt. Pouncey's Co., Ala. Mil., Fla. war.	18.00	8.00	10.00
Helpless child	do	Walter D. Weaver	George M. Weaver	Scout and master of transportation, 7th Army Corps, U. S. A.	15.00	.....	15.00
Widow	Apr. 27, 1898	M. Louise Anderson	John B. Anderson	Private, Co. K, 185th N. Y. Vol. Inf.	24.00	8.00	16.00
Invalid	do	Charles B. Eades	Same	Private, Co. K, 17th Mich. Inf.	24.00	12.00	12.00
Widow	do	Sarah R. Frary	Jedediah C. W. Frary	Private, Co. K, 11th Ky. Inf.	8.00	.....	8.00
Invalid	do	Jacob G. Frick	Same	Private, Co. H, 18th N. H. Vol. Inf.	50.00	27.50	22.50
Widow	do	Delia Gilman	Alvin Gilman	Col., 96th Pa. Inf.	12.00	.....	12.00
Invalid	do	Johnson Hayes	Same	Private, Co. H, 5th N. H. Vol. Inf.	17.00	16.00	1.00
Do	do	Benjamin F. Howland	Same	Private, Co. G, 7th Mo. S. M. Cav.	8.00	.....	8.00
Widow	do	Rosa Karger	William Karger	Wholesale Edward, Mex. war.	12.00	8.00	4.00
Do	do	Sarah A. Landrum	William J. Landrum	Landman, U. S. Navy	30.00	.....	30.00
Do	do	Elizabeth Lane	Joseph Lane	Col., 10th Ky. Inf.	40.00	20.00	20.00
Do	do	Helen Larned	Frank H. Larned	Col., 1st U. S. Artillery and Capt. 2d U. S. Art.	25.00	8.00	17.00
Nurse	do	Catharine Leary	Same	Nurse, Med. Dept., U. S. Vols.	12.00	.....	12.00
Invalid	do	Charles McAllister	William Wallace McCall	Private, Co. K, 119th Pa. Vol. Inf.	24.00	12.00	12.00
Widow	do	Martha W. McCall	Same	Private, Capt. Davis's Co., 1st Ga. Vols., Mex. war.	13.00	8.00	5.00
Invalid	do	James W. McMillan	Same	Col., 21st Ind. Inf.	50.00	30.00	20.00
Do	do	Plum P. Miner	Same	Private, Co. B, 12th Ind. Inf.	24.00	12.00	12.00
Do	do	Matthew B. Neale	Same	Private, Sabine Indian disturbances	8.00	.....	8.00
Widow	do	Frances E. Pease	William R. Pease	Col., 117th N. Y. Inf., Capt. 7th U. S. Inf.	15.00	.....	15.00

Dependent child.....	do	Jane H. Sandborn.....	Gliman J. Sandborn.....	Private, Co. K, 2d Minn. Vol. Inf.	12.00	12.00
Nurse.....	do	Emilee Taylor.....	Same.....	Private, Co. G, 34th Ill. Vol. Inf.	12.00	12.00
Invalid.....	do	David N. Thompson.....	Same.....	Private, U. S. Navy.....	8.00	8.00
do	do	John Thurston.....	Same.....	Steward, U. S. Navy.....	8.00	8.00
do	do	Moritz Tschoepe.....	Same.....	Private, Co. F, 42d Ohio Vol. Inf.	12.00	12.00
Widow.....	do	Rhoda A. Van Niman.....	Enoch J. Van Niman.....	Private, Co. Q, M. Dept., U. S. Vols. (Custer exp.)	8.00	8.00
do	do	John C. Wagener.....	Same.....	Chief packer, 9th N. Y. H. A., and B. 10th V. R. C.	20.00	20.00
Widow.....	do	Auguste Whitmer.....	Henry Whitmer.....	Private, Co. B, 24th Pa. Cav.	17.00	17.00
do	do	Jane A. Wilkinson.....	Marion L. Stone.....	Capt., Co. I, 2d Pa. Cav.	8.00	8.00
Invalid.....	Apr. 28, 1893	Ransom S. Angell.....	Same.....	Private, Co. G, 1st U. S. Vols.	20.00	20.00
Widow.....	do	Christine C. Barnard.....	Moses J. Barnard.....	Private, Co. G, 1st U. S. Vols.	30.00	30.00
do	do	Sarah Brunum.....	George W. Brunum.....	Med., 60th Pa. Inf.	24.00	24.00
Invalid.....	do	Moses M. Crants.....	Same.....	Private, Co. G, 107th N. Y. Vol. Inf.	12.00	12.00
do	do	Adelaide E. Hobbs.....	Conrad Krez.....	Nurse, Med. Dept., U. S. Vols.	30.00	30.00
Widow.....	do	Charlotte L. Walker.....	George C. Marshall.....	Med., 2d Me. Vol. Cav.	25.00	25.00
do	do	Lovelia Bayles.....	James M. Bayles.....	Capt., Co. I, 4th N. Y. Inf., and Mex. War	20.00	20.00
Invalid.....	May 7, 1893	Victor Benboucher.....	Same.....	Private, Co. E, 28th Mass. Inf.	50.00	50.00
Widow.....	do	Sarah A. Blaser.....	Jacob Blaser.....	Private, Capt. West's Co., Tenn. Vols., Ind. war 1866	8.00	8.00
do	do	A. V. Bloodgood.....	Same.....	Sergt., Co. H, 152d N. Y. Vol. Inf.	30.00	30.00
Invalid.....	do	Susan Brownlow Boynton.....	Daniel T. Boynton.....	Asst. surg., 104th Ohio Inf.	12.00	12.00
Widow.....	do	Samuel J. Busick.....	Same.....	Quartermaster, M. Dept., U. S. Vols	25.00	25.00
Invalid.....	do	John W. Channing.....	Same.....	Capt., Co. E, 7th Me. Inf.	12.00	12.00
Widow.....	do	Elizabeth Connolly.....	John H. Connolly.....	Private, Co. F, 84th N. Y. Inf. (41 N. Y. S. Militia)	20.00	20.00
do	do	Sarah E. Daub.....	George W. Daub.....	Sergt., Co. F, 54th N. Y. Inf.	12.00	12.00
do	do	Furra E. Davenport.....	Bernard S. Ullue.....	Corp., Co. D, 34th Ohio Inf.	12.00	12.00
Invalid.....	do	William S. Demott.....	Same.....	1st Lieut., Co. F, 9th Ind. Vol. Cav.	50.00	50.00
do	do	Isaiah F. Force.....	Same.....	Med., 140th N. Y. Inf.	17.00	17.00
do	do	Charles A. Foster.....	Same.....	Sgt., 63d U. S. C. Inf. and acting asst. surg., U. S. A.	12.00	12.00
do	do	Alphonse Freeman.....	Same.....	Private, Co. F, 2d U. S. Dragoons, Mex. war	20.00	20.00
do	do	Nathaniel Houghton.....	Same.....	Col., 25th Ohio Inf.	15.00	15.00
Father.....	do	Thomas S. Haddock.....	William F. Haddock.....	Private, Co. E, 21st Comp. Inf.	30.00	30.00
Sepulcher.....	do	Elizabeth Holt.....	Lemuel B. Holt.....	Private, Co. L, 16th Pa. Cav.	12.00	12.00
Nurse.....	do	Sarah E. Ingham.....	Same.....	Nurse, Med. Dept., U. S. Vols.	12.00	12.00
Father.....	do	William Joffe.....	Thomas M. Joffe.....	Private, Co. G, 15th Mich. Inf.	12.00	12.00
Widow.....	do	Eliza B. Lowry.....	Charles Martin.....	Private, Co. C, 83d Pa. Inf.	12.00	12.00
do	do	Gratia H. Martin.....	Alexander Lowry.....	Private, Co. D, 19th Va. Inf. and Co. C, 8th Va. Inf.	12.00	12.00
do	do	Lucy Ord Mason.....	John S. Mason, Jr.....	1st Lieut., Co. C, 1st U. S. Inf.	25.00	25.00
do	do	Daniel J. Melvin.....	Daniel J. Melvin.....	Private, Capt. A. C. Gordon's Co., Creek war, 1838	8.00	8.00
do	do	Joseph Montleap.....	Milton Millieap.....	Private, Co. I, 31st Iowa Inf.	8.00	8.00
Invalid.....	do	Lovelia L. Patterson.....	Same.....	Surg., 102d Ohio Vol. Inf.	24.00	24.00
do	do	Bellvay J. Priddgen.....	Alexander V. Patterson.....	Private, Co. G, 3d Me. Inf.	40.00	40.00
Invalid.....	do	Elizabeth Rodgers.....	Same.....	Surgt., Co. H, 1st Tex. Cav.	25.00	25.00
Widow.....	do	Hiram R. Rhea.....	David S. Rodgers.....	Med., 1st Tenn. Vol. Inf.	20.00	20.00
Invalid.....	do	William H. Savare.....	Same.....	Private, Co. G, 3d N. C. Mtd. Inf.	12.00	12.00
do	do	Francis Shetals, alias	Same.....	Capt., Co. A, 17th Me. Inf.	8.00	8.00
do	do	Frank Stay.....	Same.....	Scout, Co. A, Mtd. Minn. Inf., Ind. outbreak Minn., 1865	6.00	6.00
do	do				12.00	12.00

a Repeating a former special act obtained by fraud.

TABLE NO. 24.—Showing special acts granting pensions passed at the second session of the Fifty-fifth Congress, etc.—Continued.

Class.	Date of special act.	Name of pensioner.	Name of soldier.	Rank and service.	Monthly rate.		Increase by reason of special act.
					By special act.	Prior to special act.	
Mother	May 7, 1898	Sarah Spangler	John Spangler	Private, Co. A, 9th Ohio Cav.	\$12.00	.....	\$12.00
Widow	do	Mary Spier	William Spier	Capt., Co. I, 10th Ohio Vol. Inf., and Co. K, 107th O. V. I.	20.00	\$4.00	12.00
Mother	do	Anna M. Tate	Blair Tate	Private, Co. K, 20th Ohio Inf.	12.00	.....	12.00
Widow	do	Margaret L. Townsend	Charles Townsend	Private, Co. E, 10th N. H. Inf.	12.00	.....	12.00
Invalid	do	George G. Vogel	Same	Private, Co. C, 3d U. S. Inf., and Co. M, 9th Kansas Cav.	12.00	.....	12.00
Widow	do	David C. Waring	Same	Private, Co. B, 8th N. Y. Inf., and Co. I, 23d N. Y. Inf.	24.00	12.00	12.00
Widow	do	Victoria W. Wise	John Cummins	Private, Co. B, 50th Wis. Inf.	12.00	.....	12.00
Widow	May 14, 1898	William S. Adams	Same	Acting asst. surg., U. S. A.	17.00	.....	17.00
Widow	do	Mary C. Case	Augustin Phillips	1st lieut., Co. D, 48th N. Y. Inf.	17.00	.....	17.00
Do.	do	Katherine L. Cushing	William B. Cushing	Commandant, 2d U. S. Navy	50.00	30.00	20.00
Invalid	do	W. L. Faxon	Same	Surgeon, 2d U. S. Navy	12.00	8.00	4.00
Widow	do	George W. Garrison	John Girdell	Private, Co. I, 102d Pa. Inf.	12.00	12.00	12.00
Widow	do	Gracie Girdell	Smith Hadley	Capt., Co. B, 12th Ill. Inf.	12.00	.....	12.00
Widow	do	Calista Hadley	Same	Private, 1819	16.00	12.00	4.00
Helpless child	do	Emory T. Hipple	William H. Hipple	Private, Co. D, 140th Pa. Inf.	12.00	.....	12.00
Widow	do	Susan A. Huber	Jeremiah F. Huber	Capt. and Co. S., U. S. Vols.	20.00	8.00	12.00
Do.	do	Mary B. Hulings	Thomas M. Hulings	Capt., 4th Pa. Inf.	20.00	.....	20.00
Do.	do	Martha Ann Hynes	Andrew B. Hynes	2d lieut., Co. C, 5th Ia. Vols., Mex. war	12.00	8.00	4.00
Invalid	do	Ida Kayaka, or One-Armed Jim.	Same	Indian scout, U. S. A., Sioux massacre, 1892	12.00	.....	12.00
Do.	do	James H. Kille	Same	1st lieut., Co. D, 1st Tenn. I. A.	24.00	17.00	7.00
Do.	do	Frederick C. Moore	Same	Sgt., 14th N. Y. Vol. Inf.	20.00	12.00	8.00
Do.	do	Benjamin F. Moulton	Same	Acting asst. surg., U. S. Vols.	12.00	.....	12.00
Widow	do	Benjamin Olin	Charles Olin	Private, Co. I, 7th N. H. Inf.	25.00	12.00	13.00
Nurse	do	Ellen O'Rourke	Same	Nurse, Med. Dept., U. S. Vols.	8.00	.....	8.00
Widow	do	Hamish C. Pile	William A. Pile	Brig. gen., U. S. Vols.	30.00	.....	30.00
Do.	do	Louisa M. Rice	Samuel A. Rice	Private, Co. B, 4th Tenn. Inf.	50.00	30.00	20.00
Do.	do	William C. Ryan	George W. Ryan	Private, Co. G, 17th Ohio Inf.	12.00	.....	12.00
Do.	do	Annie Saffell	James Saffell	Private, Co. L, 14th N. Y. H. A.	12.00	.....	12.00
Do.	do	William D. Seaman	Same	Paymaster's steward, U. S. N.	50.00	30.00	20.00
Do.	do	Eva Sealey	Oscar Sealey	Private, Co. D, 48th Ind. Inf.	15.00	8.00	7.00
Widow	do	Oliver P. Silvey	Same	Brig. gen., U. S. A., and Mex. war	20.00	12.00	8.00
Widow	do	Ann M. Smith	Andrew J. Smith	Brig. gen., U. S. A., and Mex. war	30.00	8.00	22.00
Widow	do	Hannah Litcher Stevenson	John D. Stevenson	Brig. gen., U. S. A., and Mex. war	30.00	8.00	22.00
Invalid	do	Simpson Everett Stillwell	Same	Scout and guide, U. S. A.	12.00	.....	12.00
Do.	do	Charles E. Taylor	Same	Capt., Co. I, 4th Pa. Cav.	30.00	.....	30.00
Do.	do	Lafayette Tibbetts	Same	Private, Co. D, 74th Illinois Inf.	30.00	12.00	18.00
Do.	do	Janet Wemple	Edwin H. Wemple	Locomotive engineer, U. S. A.	8.00	.....	8.00
Invalid	do	Lewis K. Whitmore	Same	Same	25.00	.....	25.00

Widow	do	Mary A. Wise	Peter Wise	Capt. Co. I, 18th Pa. Cav.	899
Nurse	do	Annie Wittemyer	James B. Work	Nurse, Med. Dep't., U. S. Vols.	1200
Helpless child	do	Sallie Work	Same	Private, Co. F, 35th Iowa Vol. Inf.	1600
Invalid	do	William H. H. Wright	Same	Private, Co. M, 6th Pa. Cav.	1200
Do	do	Michael H. J. Crouch	Same	Surgt., U. S. Vols.	1200
May 16, 1896	do	Ira Ingraham	Same	1st Lieut., Co. K, 195th Pa. Inf.	1700
Do	do	James F. McKinley	Charles Barnes	Col., 6th Mich. Vols., Mex. war.	800
Do	do	Marcus C. Barnes	Same	Private, Co. A, 3d Batt'n 1st Prov. Kans. Mil.	1200
May 23, 1898	do	Michael Bassett	Same	Private, Co. G, 3d Iowa Inf.	1200
Do	do	Henderson H. Boggs	Same	Private, Co. A, 1st Wis. Cav.	800
Do	do	F. L. Botkin	Anna H. Botkin	Private, Co. D, 1st Conn. Cav.	1200
Do	do	Myrtle L. Hamilton	Jesse B. Hamilton	Sergeant, Co. D, 14th Wis. Inf.	2400
Do	do	Franklin Hull	Same	Private, Co. D, 14th Wis. Inf.	1200
Do	do	Russell R. King	Same	Private, Co. A, 97th Pa. Inf.	1200
Do	do	William Taylor	Joseph E. Valentine	Private, Co. I and B, 3d Iowa Inf.*	1200
Do	do	William Taylor	Joseph E. Valentine	Private, Co. I and B, 3d Iowa Inf.*	1200
Helpless child	do	J. S. Waggener	Joseph B. Waggener	Sergt., Co. F, 80th N. Y. Inf.	4000
Father	do	George H. Baldwin	Same	Private, Co. C, 87th and Co. I, 25th, Enrolled Mo. Mil.	1800
June 4, 1898	do	George Barnes	Same	Sergt., Co. A, 77th Ill. Vol. Inf.	5000
Do	do	John X. Griffith	Same	Capt. and bvt. maj., 19th U. S. Inf.	3000
Do	do	John B. Hays	Florian Hess	Private Capt. J. Behn's Co., 11th Minn. Mil.	1200
Widow	do	Maria E. Hess	Same	Private, Co. G, 140th and D, 15th, Ill. Inf.	2000
Invalid	do	Calvin P. Lynn	Same	Private, Co. H, 96th Iowa Inf.	4000
Do	do	John P. Thomas	Samuel F. Waldron	Capt., Co. I, 33d N. J. Inf.	2000
Helpless child	do	Florence N. Waldron	Same	Private, Co. D, 4th U. S. Inf.	800
Invalid	do	C. S. Alford	Same	Lieut. Col., 1st Iowa Inf.	2400
June 8, 1898	do	Benjamin Beach	Same	Private, Co. I, 7th Mich. Cav., and Mex. war.	3000
Do	do	Charles Beckwith	Horatio H. Benjamin	Capt., Co. B, 113th Ohio Inf., and maj., 185th Ohio Inf.	1200
Do	do	Mary A. Benjamin	Thomas F. Betton	Surgt., 1st U. S. Vet. Vol. Inf.	1700
Do	do	Olivia Betton	Same	Sergt., Co. K, 141st Pa. Vol. Inf.	5000
Do	do	John T. Brewster	Harry Elliott	Private, Co. B, 33d Ill. Inf.	3600
Do	do	Alonzo B. Chatfield	Thomas Emmott	Sergt., Co. D, 147th Pa. Vol. Inf.	1200
Father	do	Henry H. K. Elliott	Same	Private, 7th Battery, Mass. V. L. A., and 31st Co., 3d Batt'n R. C.	1200
Dependent child	do	Ida Emmott	David C. Gresham	Private, Co. G, 4th Pa. Cav.	3000
Invalid	do	William D. Foote	Same	Private, Ga. Vols., Ind. war of 1836.	800
Widow	do	Bettie Gresham	Same	Private, Co. C, 96th N. Y. Inf., and H, 2d N. Y. Vet. Cav.	2400
Invalid	do	Sidney J. Hare	Merlin C. Harris	Capt., Co. C, 96th N. Y. Inf.	3000
Do	do	William P. Haskell	Charles W. Hausner	Lieut., Co. I, 14th Ind. Inf.	1450
Do	do	Emily A. Hausner	Same	Sergt., Co. E, 64th N. Y. Vol. Inf.	1200
Widow	do	Charles Hoffman	Same	2d Lieut., Co. E, 78th Pa. Inf., and Mex. war.	1200
Invalid	do	Gustavus A. Kindblade	Same	Private, Co. G, 4th Iowa Inf.	2400
Do	do	James C. Kinkle	Acting asst. surgt., U. S. Army	Mal., 29th Me. Vol. Inf.	3000
Do	do	Harriet M. Knowlton	William Knowlton	Q. M. sergt., Co. D, 2d R. I. Cav.	1200
Widow	do	Aelaide H. Lamberton	Charles H. Kennon	Private, Co. E, 36th Ohio Vol. Inf.	2500
Do	do	Eliza Miller	Abraham Miller	Private, Co. A, 4th N. Y. H. A.	1200
Do	do	David Parker	Same	Private, Co. A, 4th N. Y. H. A.	800
Invalid	do	David Parker	Same	Private, Co. A, 4th N. Y. H. A.	1700

a Inoperative; soldier died prior to passage of special act.

a Inoperative; soldier died prior to passage of special act.

TABLE NO. 24.—Showing special acts granting pensions passed at the second session of the Fifty-fifth Congress, etc.—Continued.

Class.	Date of special act.	Name of pensioner.	Name of soldier.	Rank and service.	Monthly rate.		Increase by reason of special act.
					By special act.	Prior to special act.	
Widow	June 8, 1898	Julia L. Roberts	John M. Doffy	Acting asst. surg., U. S. Vols	\$17.00	.....	\$17.00
Do	do	Mary E. Taylor	William H. Taylor	1st lieut., Capt. Goodwyn's Co., Ala. Vols., Creek war	8.00	.....	8.00
Hapless child	do	Zelman Tyrell	Lewis R. Tyrell	Private, Co. A, 1st N. Y. Eng	12.00	.....	12.00
Invalid	do	George Van Vleet	Same	1st lieut., Co. H, 105th Pennsylvania Inf	24.00	.....	7.00
Do	do	George W. D. Wade	Same	Private, Co. A, 1st Ill. Vols., Mex. war	20.00	\$17.00	8.00
Widow	June 10, 1898	Nancy G. Allabach	Peter H. Allabach	Col. 131st Pa. Inf	30.00	12.00	22.00
Invalid	do	Louis D. Baker	Same	Private, Co. G, 14th N. Y. H. A.	20.00	12.00	8.00
Do	do	William A. Beckford	Same	1st lieut., Co. F, 8th N. H. Vol. Inf	50.00	50.00	20.00
Nurse	do	Jennie E. Burch	Same	Nurse, Med. Dept., U. S. Vols	12.00	.....	12.00
Invalid	do	Philip F. Castlemann	Same	Q. M. agent, Oregon Vols., Oregon Ind. war, 1855-56	15.00	.....	15.00
Do	do	George L. Durbin	Same	Private, Co. K, 4th U. S. Inf	12.00	6.00	6.00
Do	do	Daniel G. George	Same	Corp. Co. G, 146th and Co. I, 134th Ind. Inf.	30.00	12.00	18.00
Widow	do	Lucia A. Hynes	John R. Hynes	Private, Co. D, 1st Mass. Cav., and commissary U. S. Navy	30.00	12.00	18.00
Invalid	do	Charles H. Johnson	Same	Capt. and asst. Q. M., 24th U. S. Inf.	17.00	.....	17.00
Widow	do	Mary M. Macanley	Daniel Macanley	Private, Co. E, 1st N. H. A.	30.00	12.00	18.00
Invalid	do	Andrew C. Menach	Same	Brig. gen., U. S. Vols., and col. 9th U. S. Vet. Vol. Inf.	30.00	.....	30.00
Do	do	Benjamin L. Nolan	Same	Capt. Co. E, 20th Pa. Inf	30.00	20.00	10.00
Do	do	William H. Oliver	Same	Private, Co. D, 8th Mass. Inf., and Co. G, 3d U. S. Cav.	12.00	.....	12.00
Do	do	Oscar A. Palmer	Same	Private, Co. C, 104th Pa. Vol. Inf.	30.00	12.00	18.00
Do	do	Joseph Porter	Same	Private, Co. F, 111th Ohio Vol. Inf.	12.00	6.00	6.00
Do	do	Richard T. Seltzer	Same	Private, Co. K, 6th N. Y. H. A.	30.00	30.00	(a)
Widow	do	Maria Somerlat	Valentine Somerlat	Private, Co. F, 40th Mo. Vol. Inf.	8.00	.....	8.00
Invalid	do	Edward Stanley	Same	Private, Co. A, 23rd Ind. Vol. Inf.	12.00	.....	12.00
Do	do	Simson Stevens	Same	Private, Co. G, 12th Me. Vol. Inf.	24.00	8.00	16.00
Do	do	Amos Webster	Same	Private, Co. A, 15th N. H. Vol. Inf.	20.00	8.00	12.00
Do	do	Susan D. Yates	Arthur Reid Yates	Bvt. lieut. col., 1st Mass. Vol. Inf.	30.00	30.00	30.00
Widow	do	Battle Ford Brown	Orlando Brown	Capt., U. S. Navy	50.00	30.00	20.00
Do	do	Mary E. Chamberlin	Lowell A. Chamberlin	Adj., 22d Ky. Inf., and Lieut. Col., 14th Ky. Inf.	30.00	17.00	13.00
Invalid	do	Thomas Edsall	Same	Capt. Batt'y C, 1st U. S. Art.	30.00	20.00	10.00
Widow	do	Adonia Huard	Hypolite Huard	Private, Co. E, 9th Ill. Cav.	12.00	.....	12.00
Invalid	do	Halbert E. Paline	Same	Private, Capt. Manberet's Batt'n, La. V. L. A., Mex. war	8.00	.....	8.00
Do	do	Peter Castle	Same	Brig. gen., U. S. A., and Col., 4th Wis. Inf.	50.00	30.00	20.00
Do	do	Samuel B. Davis	Same	Corp. Co. D, 4th N. Y. Prov. Cav., and D, 1st N. Y. Med. Rifles	23.00	8.00	15.00
Do	do	Price W. Hawley	Same	Corp., Co. C, 18th Ind. Inf.	50.00	34.00	14.00
Do	do		Same	Private, Co. B, 73d, and Co. A, 20th Ind. Inf.	24.00	12.00	12.00

Do	Do	Lowell H. Hopkins	Same	Sergeant, Co. A, 57th Private, Co. A, 461, and Co. A, 56th Mass. Inf.	50.00	12.00	36.00
Do	Do	Alfred D. Johnson	Same	Private, Co. A, 1st Wm. Ohio Inf.	50.00	12.00	12.00
Do	Do	Clara A. Short	Marlin C. Short	Private, Co. A, 1st Wm. Ohio Inf.	50.00	12.00	12.00
Widow	Do	William Tompkins	Same	Private, Co. F, 11th Pa. Cav.	50.00	12.00	36.00
Invalid	Do	Henry H. Tucker	Same	1st Lieut., Co. B, 103d Ill. Inf. and Indian scout, U. S. A.	50.00	14.00	14.00
Do	Do		James Clifford	Private, 23d Batt'y, Ind. L. A.	25.00	12.00	18.00
Widow	June 22, 1893	Catherine Clifford	Same	Private, Co. L, 11th Tenn. Vol. Cav.	12.00	12.00	12.00
Invalid	Do	William Stephenson Smith	Same	Private, Co. C, 1st Wash. Ter. Inf. and G. 9th U. S. Inf.	30.00	12.00	18.00
Do	Do	Edward Hart	Same				
Widow	June 27, 1893	Riancha E. Barlow	A. C. Barlow	Surg., 4th W. Va. Inf. and 62d Ohio Inf.	17.00	8.00	9.00
Do	Do	Ludinda Booth	Wiley Booth	Private, Hookaby's Co. Ga. Mil., war of 1812.	20.00	12.00	8.00
Do	Do	Clarissanda L. McGuire	James E. McGuire	Capt., Co. F, 1st Ind. Inf., and Mex. war.	20.00	8.00	12.00
Invalid	Do	Carlton W. Muzzy	Same	Landman, U. S. S. Minnesota.	20.00	8.00	4.00
Widow	Do	Mary L. Page	William Page	Private, Co. I, 83d Ill. Inf.	12.00	8.00	4.00
Invalid	Do	Eljah N. Parkhurst	Same	Private, Co. A, 9th Ind. Cav.	72.00	30.00	42.00
Widow	Do	Clara R. Rodgers	Robert Edwin Rodgers	Maj., 4th Ohio Cav., and Co. K, 4th Ohio Cav.	25.00	95.00	95.00
Mother	June 28, 1893	Nancy Barger	John Barger	Private, Co. D, 45th Pa. Inf., and Co. H, 4th Pa. Inf.	12.00	12.00	12.00
Invalid	Do	John C. Brown	Same	Sergeant, Co. D, 84th N. Y. Inf., and 1st Lieut., Co. H, 5th N. Y. Inf.	30.00	17.00	18.00
Do	Do	Paul Carr	Same	Landman, U. S. S. Princeton and New Ironides.	30.00	12.00	18.00
Do	Do	Jesse O. Davy	Same	Private, Co. B, 39th, and E, 16th Ohio Inf.	12.00	12.00	12.00
Do	Do	Rebecca E. Kuts	George F. Kuts	Q. M. sergt., 17th Ohio Inf.; private, Co. F, 17th Ohio Inf.	12.00	12.00	12.00
Invalid	Do	Levi R. Long	Same	Private, Co. I, 17th Pa. Cav.	40.00	80.00	10.00
Do	Do	Thomas Madden	Same	Corpl., Co. H, 32d N. Y. Inf.	40.00	6.00	8.00
Do	Do	Charles E. Mann	Same	Sergeant, Co. H, 2d Mass. Cav.	20.00	12.00	2.00
Do	Do	John H. Mullen	Same	Capt., Co. C, 12th Conn. Inf., and sergt. maj., 12th Conn. Inf.	8.00	12.00	8.00
Do	Do	George W. Palmer	Same	Private, Co. B, 10th U. S. Inf., Mex. war.	20.00	12.00	8.00
Mother	Do	Susan M. Seesford	Thomas J. Martin	Private, Co. D, 2d Batt'n, D. C. Inf.	12.00	12.00	12.00
Invalid	Do	Samuel A. Smith	Same	Private, Co. C, 84th Ill. Inf.	12.00	12.00	12.00
Widow	Do	Julia E. Warner	Hans E. Warner	Private, Co. G, 37th Wm. Inf.	12.00	12.00	12.00
Invalid	Do	William J. Williams	Same	Private, Co. G, 6th Del. Inf.	8.00	8.00	8.00
Do	Do	Joseph C. Berry, alias White	Same	Private, Co. K, 8th Iowa Inf.	50.00	30.00	30.00
Do	July 1, 1893	John A. Bingham	Same	Maj. and J. A. Gen., U. S. Vols.	35.00	35.00	35.00
Widow	Do	Mary Broggan	Francis Broggan	Corpl., Co. F, 2d U. S. Art.; D, 2d Cal. Cav., and Ordnance Corps, U. S. A.	14.00	12.00	2.00
Invalid	Do	William Christenberry	Same	Private, Capt. Miller's Co., Tenn. Vol., Ind. war.	30.00	8.00	12.00
Do	Do	George H. Givens	Same	Private, Co. D, 1st Ky. Cav., Mex. war.	18.00	12.00	6.00
Do	Do	Joseph R. Mathers	Same	Private, Co. A, 3d W. Va. Inf.	24.00	12.00	12.00
Do	Do	Laurette Olsen	Same	Private, 2d Batt'y, Minn. L. A.	40.00	12.00	38.00
Do	Do	George W. Osborn	Same	Private, Co. C, 54th Ohio Inf.	24.00	12.00	12.00
Do	Do	Frank Rockwith	Same	Surgeon's steward, U. S. S. Arletta.	24.00	12.00	12.00
Do	Do	William L. Smithson	Same	Private, Co. D, 8th Tenn. Vols., Mex. war.	24.00	12.00	12.00
Do	Do	Juntus Alexander	Same	Private, Co. F, 1st U. S. C. Inf. and F. 9th La. C'd'A. Inf.	12.00	12.00	12.00
Do	July 7, 1893	Ephraim C. Baldwin	Same	Lieut., Cos. B and D, 1st Cal. Cav., and E, 1st Cal. Cav.	35.00	15.00	30.00
Do	Do	Susan I. Barrow	Silas Barrow	Private, Co. E, 8th Me. Inf.	12.00	12.00	12.00
Helpless child	Do						

a Inoperative; special act confers no benefit.

TABLE NO. 24.—Showing special acts granting pensions passed at the second session of the Fifty-fifth Congress, etc.—Continued.

Class.	Date of special act.	Name of pensioner.	Name of soldier.	Rank and service.	Monthly rate.		Increase by reason of special act.
					By special act.	Prior to special act.	
Invalid	July 7, 1898	Samuel H. Beckwith	Same	Private, Co. F, 11th Ill. Inf. and Tel. Corps, Q. M. Dept., U. S. Vols.	\$30.00	\$12.00	\$18.00
Stepfather	do	John R. Bevan	Edward L. Bowden	Private, Co. G, 1st Me. H. A.	12.00		12.00
Invalid	do	Joel Blackman	Same	Private, Co. K, 4th N. H. Vol. Inf.	30.00	12.00	18.00
Widow	do	Theresa Bonnaveau	John B. Bonnaveau	Private, La. Vols., Mex. war	8.00		8.00
Invalid	do	Patrick Breen	Same	Serg't., Co. A and D, 21st U. S. Inf., and G, 1st U. S. Cav.	12.00		12.00
Do	do	Foster C. Carl	Same	Private, Co. I, 1st N. Y. Mtd. Rifle	18.00		18.00
Do	do	Abraham T. Casey	Same	Private, Co. H, 1st Ill. Cav.	12.00	12.00	8.00
Helpless child	do	Mary Hannah Clark	John W. Clark	Serg't., Co. B, 8th Mass. V. Inf., and A, 4th Mass. H. A.	12.00		12.00
Widow	do	Mary C. Cook	Lewis G. Cook	Mat. and Acting Master, U. S. Navy	20.00	12.00	8.00
Invalid	do	Newton W. Cooper	Same	Serg't., Co. H, 3d Pa. H. A., and C, 20th V. R. C.	50.00	12.00	38.00
Do	do	Alphonso O. Drake	Same	Private, Co. E, 2d R. I. Vol. Inf.	20.00	12.00	8.00
Do	do	Alvah A. Eaton	Same	Private, Co. A, 28th N. Y. Inf.	24.00	12.00	12.00
Widow	do	Margaret Ferriter	Patrick Ferriter	Private, Co. F, 24th Wis. Inf.	8.00		8.00
Invalid	do	Michael J. Fogarty	Same	Private, Co. F, 12th U. S. Inf.	50.00	36.00	14.00
Widow	do	Henrietta Fowler	Jesse Fowler	Private, Ga. Vols., Ind. war of 1836.	12.00		8.00
Nurse	do	Martha J. Freer	John J. Gibbons	Nurse, Med. Dept., U. S. Vols.	20.00	12.00	8.00
Mother	do	Ann Gibbons	Same	Capt., Co. C, 62d Ill. Inf.	30.00	12.00	18.00
Invalid	do	Jeremiah Hackett	Same	Private, Co. C, 4th Mass. H. A.	30.00	12.00	18.00
Do	do	James C. Hervey	Same	Capt., Co. I, 63d Ind. Inf.	30.00	20.00	10.00
Do	do	Henry Hineley	Same	Private, Co. G, 5th Vt. Inf.	12.00	6.00	6.00
Do	do	James E. Jones	Same	Bvt. col. and A. Q. M., U. S. Vols.	25.00		25.00
Widow	do	Fannie Kautz	August V. Kautz	Col., 8th U. S. Inf. and 2d Ohio Cav.	50.00	30.00	20.00
Helpless child	do	Mary E. Liline	John Kline	Capt., Co. H, 13th Pa. Cav.	12.00		12.00
Invalid	do	John N. Landon	Same	Private, Co. H, 135th Pa. Inf., and Co. K, 15th Pa. Inf.	16.00	10.00	6.00
Do	do	William Manley	Same	Private, Co. L, 16th Mich. Inf.	50.00	24.00	26.00
Widow	do	Cornelia M. Mason	John S. Mason	Col., 9th U. S. Inf. and 4th Ohio Inf.	30.00		30.00
Helpless child	do	Jacob Miller	Abraham Miller	Private, Co. E, 36th Ohio Inf.	12.00		12.00
Invalid	do	Warren W. Moripan	Same	Private, Co. G, 8th U. S. Inf.	12.00	8.00	4.00
Do	do	William B. Murray	Same	Private, Co. I, 10th Tenn. Inf.	30.00	12.00	18.00
Do	do	William J. Murray	Same	Telegraph Corps, U. S. Vols.	12.00		12.00
Nurse	do	Ellen E. Nash, formerly Moss	Same	Nurse, Med. Dept., U. S. Vols.	12.00		12.00
Widow	do	Belle Peter	Henry W. Peter	Acting asst. surg., U. S. Vols.	12.00		12.00
Invalid	do	George D. Phinney	Same	Private, Co. A, 7th Wis. Inf.	36.00	30.00	6.00
Helpless child	do	Pauline Robbins	Edith Robbins	Private, Co. I, 184th N. Y. Inf.	12.00		12.00
Invalid	do	Barney Smith	Same	Private, Co. E, 10th Tenn. Inf.	12.00		12.00
Do	do	Almon Stuart	Same	Private, Co. I, 9th Ind. Inf.	34.00	12.00	18.00
Do	do	Edson Sullivan	Same	Private, Co. C, 1st N. H. H. A.	34.00	12.00	12.00

Widow	do	Matilda Waedel	Ferdinand Waedel	Private, Co. H, 35th Wis. Vol. Inf.	20.00	8.50	8.00
Invalid	do	Mary E. Walker	Little B. Waite	A. A. (contract, surr.), U. S. Navy	20.00	12.00	11.00
Widow	do	Mary A. Waite	Same	Private, Co. G, 1st Ala. Vol. Cav.	20.00	12.00	18.00
Invalid	do	Edward R. Young	Same	Bugler, Battery H, 1st U. S. Art.	20.00	8.00	20.00
do	do	James C. Young	Same	Private, Co. C, 50th Ill. Inf.	12.00	8.00	12.00
do	do	James C. Young	Same	Private, U. S. Vols.	15.00	8.00	18.00
Nurse	July 8, 1898	Addie L. Bailou	Wesley W. Hasset	Nurse, Med. Dept., U. S. Navy	80.00	12.00	8.00
Widow	do	Annie J. Hasset	Same	Lieut. commander, U. S. Navy	80.00	12.00	4.00
Invalid	do	John H. Boyd	Same	Private, Co. C, 8th Iowa Inf., and Co F, 1st Iowa Cav.	13.00	8.00	17.00
do	do	James S. Chapman	Same	Private, Co. B, 5th Batt'n Ohio Vol. Cav.	25.00	8.00	8.00
do	do	Diana Clark	Charles Clark	Capt. Co. B, 30th Iowa Inf.	8.00	.....	8.00
Widow	do	Cassius M. Clay, sr.	Same	MaJ. gen., U. S. Vols. and Mex. war	12.00	.....	12.00
Invalid	do	John Connolly	Thomas Connolly	Private, Co. A, 69th N. Y. Vol. Inf.	12.00	.....	12.00
Father	do	Corydon G. Crafts	Moses Crafts	Musician, band, 10th Me. Inf.	12.00	.....	12.00
Helpless child	do	Clarissa A. Dunham	Marcus N. Dunham	Private, Co. D, U. S. Engineers, and Co. K, 8th Mich. Inf.	20.00	12.00	8.00
Stepmother	do	James E. Eaton	Same	Landman and yeoman, U. S. S. Princeton and Wissahickon	20.00	12.00	8.00
Invalid	do	Armedas H. Evans	Same	Private, Co. C, 6th W. Va. Inf.	20.00	12.00	8.00
Widow	do	Virginia C. Flea or	Henry Daugherty	Col. 22d Ill. Inf. and Mex. war*	30.00	.....	30.00
do	do	Sarah Fry	Henry Fry	Purser, U. S. Navy, war of 1812	20.00	12.00	8.00
Invalid	do	Clark W. Harrington	Same	Scott, Co. I, 93d N. Y. Inf.	30.00	17.00	13.00
do	do	Miriam W. Kenny	Samuel W. Kenny	Scott, U. S. Vols.	12.00	12.00	(a)
Invalid	do	Herbert W. Leach	Same	Seaman, U. S. S. Jeannette	12.00	.....	12.00
Widow	do	Mary McLaughlin	James McLaughlin	Capt. Co. I, 10th Kans. S. Mil.	12.00	.....	12.00
Invalid	do	Prior Perkins	Same	Scout and guide, U. S. A.	12.00	.....	12.00
do	do	Engene A. Shaw	Same	Sgt., Co. C, 22d Ky. Inf.	12.00	12.00	12.00
do	do	Oliver H. South	Same	Nurse, Med. Dept., U. S. Vols.	12.00	.....	12.00
Nurse	do	Mary Ann Sullivan	James J. Sullivan	Private, Co. B, 68th N. Y. Inf.	12.00	.....	12.00
Mother	do	Felix Talt	Same	Private, Co. G, 1st Tex. Mounted Vols., Mex. war	20.00	12.00	8.00
Invalid	do	Alden B. Thompson	Same	Landman, U. S. S. Columbus and Ohio	8.00	.....	8.00
do	do	George S. Walton	Same	Sgt., Co. N, 2d Mo. Mounted Vols., Mex. war	24.00	12.00	12.00
do	do	John N. Wiley	Same	Private, Co. G, 63d Ind. Inf.	30.00	17.00	13.00
do	do	Jane E. Zink	James M. Shane	Col. 98th Ohio Inf.	30.00	.....	20.00
Widow	do	Grand total b			8,496.00	2,911.50	5,584.50

a Inoperative; special act confers no benefit.

b Exclusive of four inoperative acts and one act repealing a prior special act.

Recapitulation.—Special acts, Fifty-fifth Congress, first regular session.

Granting—	
\$72 per month	1
50 per month	30
40 per month	8
36 per month	3
35 per month	3
30 per month	73
25 per month	19
24 per month	26
20 per month	50
18 per month	5
17 per month	13
16 per month	4
15 per month	7
14 per month	1
12 per month	109
10 per month	2
8 per month	35
Inoperative	4
Repealing prior act	1
Total	394
Net increase per month, \$5,584.50; per annum, \$67,014.	

RECORD DIVISION.

TABLE NO. 25.—*Statement showing the number of applications for army pensions under acts of July 14, 1862, and March 3, 1873, filed during the fiscal year ended June 30, 1898.*

GENERAL LAW.

Original applications:	
Invalid original	2, 217
Widows' original	5, 465
Minors' original	1, 396
Mothers' original	69
Fathers' original	55
Brothers' and sisters' original	31
	7, 016
Total	9, 233
Act of June 27, 1890, pending:	
Invalid original	1, 613
Widows' original	1, 190
Minors' original	152
Mothers' original	16
Fathers' original	5
Brother and sisters' original	1
	1, 364
Total	2, 977
Act of June 27, 1890, admitted:	
Invalid	1, 795
Widows	1, 468
Minors	93
Mothers	3
Fathers	3
	1, 567
Total	3, 362
Applications for increase	55, 203
Duplicate applications:	
Invalid	2, 070
Dependents	1, 540
Total	3, 610
Army nurse applications	97
Grand total filed under general law	74, 482

Statement showing the number of applications for army pensions under act of June 27, 1890, filed during the fiscal year ended June 30, 1898.

ACT OF JUNE 27, 1890.

Original applications:	
Invalid original	12, 097
Widows' original	12, 343
Minors' original	1, 239
Mothers' original	310
Fathers' original	179
Brothers' and sisters' original	10
	<hr/>
	14, 061
Total	26, 178
General law, pending:	
Invalid original	2, 592
Widows' original	2, 368
Minors' original	226
Mothers' original	58
Fathers' original	25
	<hr/>
	2, 677
Total	5, 269
General law, admitted:	
Invalid	3, 923
Widows	50
Minors	208
Mothers	9
Fathers	1
	<hr/>
	268
Total	4, 191
Applications for increase	50, 654
Duplicate applications:	
Invalid	39, 363
Dependents	2, 180
	<hr/>
Total	41, 543
Total filed under act June 27, 1890	127, 835

Respectfully submitted.

G. C. KNIFFIN,
Acting Chief Record Division.

TABLE No. 26.—MEDICAL DIVISION.

DEPARTMENT OF THE INTERIOR,
BUREAU OF PENSIONS,
Washington, D. C., July 15, 1898.

SIR: I have the honor to submit the following report of work performed by the medical division of the Bureau for the year ended June 30, 1898.

The duties of the division are to decide all medical questions pertaining to claims for pensions, to wit:

1. In invalid claims under the general laws, the rate of pension for disabilities and their pathological results.

(a) In widows' claims under the general laws, whether death cause was due to disabilities of service origin.

(b) In invalid claims under act of June 27, 1890, the degree of disability for the performance of manual labor from all causes, not due to vicious habits, and to fix the rate therefor.

2. To order examinations in the following classes of claims:

- (a) Original claims rejected on medical grounds.
- (b) Increase claims rejected on medical grounds dependent on new medical evidence filed.
- (c) Claims reduced or dropped on medical grounds.
- (d) Claims in which examinations are to be made at home or in hospital.
- (e) Claims in which examinations are to be made by specialists.
- (f) Claims in which examinations are to be made by civil or foreign surgeons.
- (g) Claims in which there is a question of eliminating vicious habits.
- (h) Claims of insanity.
- (i) Claims looking to second and higher grades.
- (k) Claims of helpless minors.
- (l) Claims under act of August 4, 1886.

3. To record all examinations ordered by the Bureau, mail the order to the claimant, a corresponding order to the examining surgeons, and a card notice to the attorneys.

4. To receive and examine the certificates and return such as require amendments.

5. To record each certificate of examination and forward it to the proper adjudicating division, to be applied to the claim.

6. To examine the accounts of examining surgeons and approve them for payment when found correct.

7. To record all claims received in the division, from whatever source, to properly dispose of them either by adjudication, medical opinion, or medical examination, and to charge and deliver them to the proper division, or to the Commissioner, or the Deputy Commissioners, as the case may be.

Immediately after assuming charge, and with your approval, I reorganized the division by forming it into sections, as follows:

A section of medical reviewers; two sections of medical examiners; an eye and ear section; an appeal section; a section to review certificates; a section on accounts; a section to record examinations and certificates and do general correspondence; and a files section, with a chief of each section.

After a year's trial I am pleased to say that the present organization gives great satisfaction. There is more uniformity of action, and more and better work is accomplished, with scarcely any friction. This is shown particularly by the fact that while there was an accumulation of some 15,000 claims awaiting medical action when the reorganization was effected, there were not over a thousand in the division at the end of the fiscal year.

A claim, when received in the division ready for adjudication, is charged to a medical examiner, who, after a consideration of the evidence and the certificates of medical examination, indorses his action on the brief face, to which he affixes his signature and the date. The claim is then charged to a medical reviewer, who, if he concurs, indorses it with his name or initials, and then the claim receives the signature of the medical referee and is charged to the appropriate division. Claims received requiring a medical opinion are similarly charged.

When a reviewer does not agree with the action of an examiner, he returns the claim, through the chief of the examiner's section, with a written statement of such changes as he may suggest. If the chief of section agrees with the reviewer, the change is made. If, however, he agrees with the action of the examiner and not with the reviewer, the

chief of section confers with the chief of the reviewer's section, and if these two agree, they approve the action of the examiner. If these can not agree, the claim is referred to the medical referee.

The advantage of this practice will be appreciated when it is shown as a fact that an average of less than one case of this nature a week has been referred to the medical referee.

All claims referred by the Commissioner and Deputy Commissioners, claims on appeal, for reduction or dropping, reversing former action, and claims carrying \$50 and \$72 per month, respectively, are signed personally by the medical referee.

In recording orders for medical examination the name and service of claimant, the number of his claim, and the board of surgeons or the surgeon to whom ordered are also entered.

Certificates of medical examination are, on their receipt, sent direct from the mail division to the medical division, accompanied by the accounts of the examining surgeons. They are referred to the certificate section, stamped with the date of receipt, and recorded. Here they are carefully reviewed by acting medical examiners, and if found satisfactory they are so indorsed and with the accounts are referred to the accounts section, where the accounts are examined, and if correct the certificates are referred to the record section and recorded, showing the date of examination, the date of receipt in the division, and the date when sent to the claim. The certificates are then sent to the proper divisions to be applied to the claims.

It frequently occurs, however, when the claim comes for final medical adjudication and the certificate is compared with other certificates and evidence in the claim, that it lacks one or more essentials. To avoid doing injustice to claimants it then becomes necessary to order another examination by a different board, thus delaying the adjudication of the claim and causing additional expense to the Government. Probably three-fourths of the so-called test examinations are made because examining surgeons either do not understand their duties, fail to conform to the requirements of the Bureau, or neglect to comply with them. There is no excuse for this, for the reason that each examining surgeon was furnished with a new book of instructions, issued a year ago, which is so full and definite that any physician who studies it should be able to formulate a satisfactory certificate. Besides this, several special circulars have been issued for the guidance of the examining surgeons.

A material improvement is shown, however, and under your wise direction that all certificates which do not comply with the requirements of the Bureau shall be returned for amendment, and if examining surgeons fail to make them satisfactory, they shall not be approved for payment, it is believed the evil will be reduced to a minimum. One of the great disadvantages in the adjudication of claims is the requirement that examining surgeons shall rate disabilities, because of the want of uniformity in the rates they recommend.

It is the experience of every medical examiner and reviewer that the surgeons' ratings are misleading and unfair, and far better results would be obtained and much greater justice done to claimants if examining surgeons would lay more stress on a thorough examination and less on the ratings in their certificates. Surgeons, as a rule, lay too much stress on ratings and omit or restrict the more important matter—a thorough description, a complete pen picture of the claimant's disabilities. The only way to make surgeons' ratings of any value in the adjudication of a claim—the determination of the proper rate of pen-

sion—would be to send experienced medical examiners to instruct the boards as to the proper method of rating.

A great cause of delay when you took charge of the Bureau was the practice of many examining surgeons to withhold the certificates of examination for an indefinite time, entailing on the medical division much unnecessary correspondence, as well as unnecessary delay in the adjudication of claims. An order issued by you that all "certificates of examination for each day's work must be at once made out and properly signed, then forwarded to this Bureau within seven days from the date of examination," and that a "failure to comply with this order will be regarded as sufficient cause to warrant the retirement of the examining surgeon or surgeons to whose neglect the delay is traceable," has caused a very material change, and with but few exceptions certificates are now promptly forwarded.

Another prominent abuse was the practice of attorneys to return orders for medical examination to the Bureau with a request that claimants be ordered before other boards, instead of forwarding the orders to the claimants.

This abuse grew to such magnitude that you issued an order directing that all orders for medical examination be sent direct to the claimant, and a card notice to the attorneys that such examinations were ordered. The result of this order has been very salutary. Since this change of practice very few orders are returned, and claimants, as a rule, are more prompt in presenting themselves for examination.

The Bureau is in receipt of a large number of letters from claimants, their attorneys, Members of Congress, and others, urging expedition in the disposal of claims. Very often it is found on examination of the claim that it awaits the receipt of certificate of medical examination, which had been regularly ordered, the order having been returned by the examining surgeons, after having been held by them for three months, with the indorsement, "Claimant failed to appear within the specified time." The "held up" files of the division are burdened with claims wherein it has been considered to the interest of the claimant that a test examination be made, or where the examination is obligatory under the order that "when no medical examination has been made of the claimant within three years of the time of adjudication of the claim it will not be admitted without another medical examination."

Claimants should be made to understand that their claims can only be intelligently disposed of after the receipt of the certificates of examination and that the promptness with which such examination is made will materially expedite the adjudication of their claims, and, on the other hand, that delay, neglect, or failure to appear for examination, or useless correspondence, seeking a waiver of examination, a change of order, or an explanation, will only delay the final disposition.

If by a general circular letter claimants and their attorneys can be made to appreciate the fact that no examinations are ordered unless absolutely necessary, and when ordered no further action will be taken until the receipt of the certificate of medical examination, and that the sooner claimants present themselves for examination after the receipt of their orders the earlier will their claims be considered, much dissatisfaction will be removed, useless correspondence avoided, the number of claims in the "held up" files greatly reduced, and the claims now therein reduced to the minimum.

The Bureau is also in daily receipt of letters from claimants or their attorneys requesting that orders for medical examination be changed to some other board of examining surgeons. It is the practice of the

Bureau, where another board of surgeons is accessible to the claimant, not to order him before the board which last examined him, as the opinion of other surgeons is thereby secured in the case, affording the Bureau such additional information as to often be of material benefit in the proper disposition of the claim.

With very few exceptions the boards of examining surgeons are now doing satisfactory work.

The principal reason why so many certificates have been returned for amendment was the failure to comply with the requirements of the book of instructions, especially paragraph 66, which says:

The object of a medical examination is to obtain a full and complete description of the disabilities for which pensions are claimed, and to gain a clear and distinct idea of the extent to which they disable for the performance of manual labor. Not only is it necessary to obtain this information in regard to the disabilities claimed, but every existing disability, whether mentioned in the order for examination or not, whether alleged by the claimant or not, should be described and rated, and pathological relationship to prior diseases or injuries must be inquired into and the conclusions of the board recorded on the certificate.

Another reason was the fact that some boards were contented to make the statement that an organ was normal when no disease thereof was found; but it has proved to be unsafe to accept this statement, for the reason that it too often occurs that a prior certificate describes a pathological condition, leaving it questionable whether a careful examination has really been made. We therefore require that where disabilities are alleged the certificate of examination must show that a thorough examination was made, whether the result is positive or negative.

There are 121 employees in the division, to wit: A medical referee, an assistant medical referee, 2 qualified surgeons, 2 principal examiners, 37 medical examiners, 1 clerk of class 4, 3 of class 3, 19 of class 2, 20 of class 1, 19 at \$1,000, 12 copyists (\$900 each), 3 messengers, and 1 assistant messenger.

The medical referee has general supervision of the working force of the division, and is responsible for the disposition of the work. The assistant medical referee has charge of all cases referred to the division by the Commissioner or the Deputy Commissioners. Two of the medical examiners re-review all cases which, under the practice, receive the personal signature of the medical referee, and with the assistant medical referee are his special advisers.

The other employees are employed as follows: 16 are medical reviewers, 34 medical examiners and acting medical examiners, 4 adjudicate eye and ear cases, 5 dispose of cases on appeal, 12 review certificates, 9 examine accounts, 19 record examinations and certificates, 12 are file clerks, and 2 do the typewriting for the division. The other 4 perform the messenger work.

During the fiscal year 7,259 original claims under the general law were admitted and 4,359 were rejected. Other claims admitted under this law numbered 16,319, while 18,203 were rejected. 22,316 claims were returned with medical opinions and 18,103 examinations were ordered. Under the act of June 27, 1890, there were 37,709 original claims admitted and 22,941 rejected, while 14 claims were rejected "no benefit." Increase claims admitted under this act numbered 10,270 and 15,705 claims were rejected; 24 claims were reduced and 6 dropped. 13,054 examinations were ordered and 25,091 claims were returned with medical opinions. Since March 19, 1898, 2,014 appeal claims were considered. Prior to this date no separate record of these claims was kept.

The total number of orders issued for medical examination by the division was 227,191. There were 203,372 certificates of examination received and 24,627 orders were returned, the claimants having "failed to appear." Of this total number of examinations ordered 8,558 were before expert (3,803), civil (1,584), United States Army (12), and foreign surgeons (56), including 3,103 home or special examinations. Of the 8,558 orders 1,490 were returned and not accounted for, while 7,068 certificates were received. There were 166,256 surgeons' certificates accepted and 25,802 returned for amendment.

The total number of examinations approved for payment was 177,100 and the amount paid therefor was \$894,119.10. Three thousand one hundred and thirty letters were typewritten and 139,000 envelopes addressed. Numerous circulars, copies of the new form of certificate and of the new book of instructions of 1897 were forwarded to the 1,418 boards of surgeons, the 238 single surgeons, and the 230 specialists of the Bureau. One hundred and thirty-eight copies of certificates of medical examination were made from the records. All Congressional inquiries relating to cases held up in this division were answered. About 1,000 circulars were sent in reply to Congressional inquiries and over 1,000 relative to certificates of examination were sent to examining surgeons.

Accompanying this report is a tabulated statement of the work performed during the fiscal year.

Very respectfully,

J. F. RAUB,
Medical Referee.

Hon. H. CLAY EVANS,
Commissioner of Pensions.

TABLE No. 26.—Number of boards of examining surgeons, single surgeons, and specialists by States, on June 23, 1898, within the classified and the unclassified service.

States.	Unclassified.	Classified.	Single surgeons.	Specialists.
Alabama.....	10	0	2	
Arizona.....	3	0	1	
Arkansas.....	20	4	3	
California.....	16	5	7	
Colorado.....	17	1	12	
Connecticut.....	7	3	1	
Delaware.....	3	1	0	
District of Columbia.....	0	3	0	
Florida.....	4	0	7	
Georgia.....	8	0	4	
Idaho.....	1	0	6	
Illinois.....	88	5	6	
Indiana.....	69	20	3	
Indian Territory.....	4	0	2	
Iowa.....	83	2	6	
Kansas.....	86	5	8	
Kentucky.....	72	3	5	
Louisiana.....	1	2	2	
Maine.....	23	3	5	
Maryland.....	10	2	2	
Massachusetts.....	12	9	7	
Michigan.....	53	8	7	
Minnesota.....	47	2	3	
Mississippi.....	3	3	4	
Missouri.....	84	6	3	
Montana.....	5	0	5	
Nebraska.....	52	2	11	
Nevada.....	0	0	1	
New Hampshire.....	12	0	3	
New Jersey.....	7	6	3	
New Mexico.....	4	0	6	
New York.....	41	25	14	
North Carolina.....	9	0	15	
North Dakota.....	9	0	1	

Fee motions for reconsideration received	34
Fee motions, former decision affirmed.....	32
Fee motions, former decisions reversed.....	2
	<hr/> 34

Total number of cases acted upon by the Secretary.....	513
Total number of cases in which question of fee has been determined without appeal.....	4,203
Total number of letters written relating to question of fees.....	5,062

APPEALS TO THE SECRETARY FROM THE REJECTION OF CLAIMS BY THIS BUREAU.

Total number of appeals received from the Secretary during the year ended June 30, 1898	12,057
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Number of appeals dismissed upon recommendation of the Commissioner:

Rejected on legal grounds.....	67
Rejected on medical grounds.....	433
Total	<hr/> 500
Number of claims in which the action of the Commissioner has been affirmed	3,326
Number of claims in which the action of the Commissioner has been reversed	<hr/> 396

Total number acted upon by the Secretary.....	4,222
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Leaving number of appeals to be acted upon	7,835
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ABSTRACT AND SUMMARY IN CASES REVERSED BY THE HONORABLE SECRETARY OF THE INTERIOR.

Of the 396 claims in which the action of the Commissioner has been reversed by the Honorable Secretary of the Interior, I have the honor to submit abstracts showing the date and ground of rejection and date and ground of reversal in 330 cases.

It is shown that 21 of said cases are again in the hands of the Secretary and 45 in the field for investigation.

Summary.

Total number of reversals.....	396
Cases abstracted	330
Cases in hands of Secretary	21
Cases in field for investigation	<hr/> 45

The abstract shows:

Reversals of legal rejections where action was taken prior to April 1, 1897..	88
Where action was taken after April 1, 1897.....	60

Total reversals of legal rejections.....	148
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Of the 60 reversals, where the rejection was subsequent to April 1, 1897, but 14 were direct reversals, since 46 were returned for further evidence.

It also shows reversals, where rejection was on medical grounds, 182.

Of this number, 77 were direct reversals; 52 were based upon advisory medical opinions, and 53 returned for further evidence.

In conclusion, allow me to say that the amount of work shown by this report is an index of the faithful manner in which the reviewers and clerks of the board of review have earnestly labored during the past year to aid you in your often-expressed desire for final adjudication of the claims of the old soldiers, their widows, minors, and dependent relatives.

Very respectfully,

F. D. STEPHENSON,
Chief of the Board of Review.

Hon. H. CLAY EVANS,
Commissioner of Pensions.

TABLE NO. 28.—*Statement showing value of pension roll June 30 of each year and amount paid the following fiscal year.*

Year.	Annual value of pension roll.	Amount paid each year.	Average annual value of each pension.	Average annual value under general law.	Average annual value under act June 27, 1890.
June 30—					
1890	\$72,052,143			\$133.94	None.
1891	89,247,200	\$116,979,172		131.99	\$121.51
1892	116,879,867	139,159,356	\$133.41	144.36	116.20
1893	130,510,179	156,740,467	135.10	157.65	113.75
1894	130,120,863	139,804,461	134.20	155.08	115.13
1895	130,648,365	139,807,337	133.94	158.39	112.15
1896	129,485,587	138,214,761	133.39	161.05	109.55
1897	129,795,428	139,949,717	133.17	162.04	109.25
1898	130,968,465	144,651,879	131.79	163.21	108.11

NOTE.—June 30, 1890, the annual value of the roll was \$72,052,143. The act of June 27, 1890, had just passed, under which many claims were allowed, and the next year there was paid out \$116,979,172. June 30, 1891, the value being \$89,247,200, there was paid out the fiscal year following \$139,159,356. The annual value of the roll had grown to \$116,879,867 by the close of that fiscal year—June 30, 1892—and there was paid out the following year \$156,740,467. The difference between the annual value at the close of the year and the amount paid the following year is accounted for by first payments, releases from new law to old, accrued pensions, and payments to widows and minors whose pensionable period has passed and the accumulated pension is granted and the pensioner comes on the roll for the one payment, then is dropped under "deaths," remarriages, "minors," or "for other causes."

TABLE NO. 29.—*Showing number of employees, amounts appropriated for salaries and for special examinations from July 1, 1864.*

Year.	Number of employees.	Amounts appropriated for salaries.	Amounts appropriated for expenses, account special examinations. a	Year.	Number of employees.	Amounts appropriated for salaries.	Amounts appropriated for expenses, account special examinations. a
1865		\$236,340.00		1884	1,555	\$1,941,550.00	\$370,185.73
1866		236,185.00		1885	1,682	2,196,353.80	580,000.00
1867		308,361.49		1886	1,682	2,164,650.00	580,000.00
1868		305,186.20		1887	1,554	2,031,120.27	510,000.00
1869		367,275.80		1888	1,554	2,018,750.00	415,000.00
1870		333,090.00		1889	1,554	2,018,750.00	415,000.00
1871		367,418.03		1890	1,554	2,018,750.00	415,000.00
1872		426,315.71		1891	2,009	2,425,337.06	415,000.00
1873	334	456,049.00		1892	2,009	2,506,810.00	215,000.00
1874	342	446,580.00		1893	2,009	2,506,810.00	225,000.00
1875	459	464,821.21	\$40,000	1894	2,009	2,491,810.00	400,000.00
1876	364	468,901.21	40,000	1895	2,005	2,487,037.39	500,000.00
1877	339	446,785.00	50,000	1896	1,836	2,281,710.00	500,000.00
1878	338	444,430.00	40,000	1897	1,836	2,281,710.00	500,000.00
1879	378	493,258.70	40,000	1898	1,836	2,281,710.00	450,000.00
1880	379	562,624.30	40,000	1899	1,741	2,166,210.00	400,000.00
1881	520	687,155.00	40,000				
1882	733	900,535.00	125,000			45,796,776.04	7,605,185.73
1883	1,559	1,926,848.77	300,000				

a Prior to 1875 the cost of examinations of claims was paid from the appropriation for "Contingent fund."

150 special examiners for field examinations, added by Commissioner Dudley, have been continued each year since at \$1,300 per annum, \$196,000, and are included in number of employees and amount in appropriations.

INT 98—MIS—6

TABLE No. 30.

DEPARTMENT OF THE INTERIOR,
BUREAU OF PENSIONS,
OFFICE OF THE CHIEF CLERK,
Washington, D. C. July 9, 1898.

SIR: I have the honor to report that during the past fiscal year the general average of work performed in the Bureau has largely increased over that of last year. Good order has generally prevailed, and employees as a rule have shown commendable zeal in the discharge of their duties.

That the best possible results have been obtained from the work performed by the force under the superintendent's direction is shown by the improved conditions, sanitary and decorative, prevailing throughout the building. That any cause of complaint should exist is largely due to lack of laboring force and limitation of appropriations.

The report of the chief of admitted files is worthy of especial attention, showing an increase in work over that of 1897 of 109,836 cases handled and 292,430 pieces of evidence applied. The work performed in 1897 was 274,880 cases drawn, 207,198 cases filed, and 67,673 pieces of evidence applied, a total of 549,751, and for 1898 was 345,498 cases drawn, 246,416 cases filed, and 158,970 pieces of evidence applied, a total of 750,884. This showing is particularly gratifying, as the work in that division is accomplished under conditions of much physical discomfort, due to the location of the file rooms immediately underneath the roof, where the changes of temperature are extreme. During the year 52,256 original claims were added to the admitted files. The total of certificate cases now in said files or in pending files awaiting action on claim for increase is 1,430,200.

But little space is now left for the further disposition of admitted claims, and this question presents a serious problem, and one that will require earnest attention in the near future.

That the army and navy survivors' division has not been idle appears from the report of the chief of that division. In 1897 the names and addresses of 193,386 soldiers were furnished on call from the different adjudicating divisions, and in 1898 the number increased to 317,453, showing a gain for the year of 124,067. It also appears that 136,000 new names and addresses were added to this list, this part of the work being largely increased as a result of a card system now in use in the adjudicating divisions. This division has for immediate reference the names and addresses of nearly 1,000,000 survivors of the war.

As illustrating in part the needs of this Bureau in the way of supplies, to keep it in effective operation, attention is called to the fact that the requisitions filled and supplied through the stationery division included 8,111,000 white envelopes, 1,017,950 manila envelopes, 19,445,825 blanks of all descriptions, 7,186 books of record, and 21,000 pamphlets.

There are over 100 typewriting machines in use in the Bureau.

The attorneys' room, an unpretentious but valuable addition to the working machinery of the Bureau, shows an increased output in work, the number of cases handled exceeding that of last year by 6,313. The report of the clerk in charge shows that during the past year requests were filed for 50,056 cases. Of this number 36,929 were drawn for examination, and 13,127 slips were returned to the attorneys with the last charge, the cases being out of the files.

There is a notable increase in the volume of work done by the Bureau shown in the report of the chief of the mail division. Nothing could indicate more clearly the increased demand on the resources of the Bureau than the fact that 1,510,199 pieces of mail matter were handled in this division in excess of that handled in 1897. The report of the chief of the division shows the receipt during the year 1898 of 218,489 applications and 3,871,545 pieces of mail exclusive of applications; the outgoing mail reached 2,476,933 pieces, an increase over 1897 of 449,537 pieces.

It is proper to add in this connection that the clerks are almost without exception promptly at their desks at 9 a. m. and 1 p. m., the tardy list being reduced practically to unavoidable causes. In this matter the chiefs of divisions have set a commendable example.

Respectfully submitted.

**Hon. H. CLAY EVANS,
*Commissioner of Pensions.***

W. H. BAYLY, *Chief Clerk.*

ADDENDA.

COMMISSIONERS OF PENSIONS SINCE 1861.

Name.	Whence appointed.	Date of commission.
Barrett, Joseph H.....	Ohio.....	Apr. 15, 1861
Cox, Christopher C.....	Maryland.....	July 28, 1861
Van Aernam, Henry.....	New York.....	May 1, 1861
Baker, James H.....	Minnesota.....	Apr. 20, 1871
Atkinson, Henry M.....	Nebraska.....	Mar. 26, 1871
Gill, Charles R.....	Wisconsin.....	Feb. 10, 1871
Bentley, John A.....	Wisconsin.....	Mar. 28, 1871
Dudley, William W.....	Indiana.....	June 27, 1881
Clarke, Otis P. G.....	Rhode Island.....	Nov. 15, 1884
Black, John C.....	Illinois.....	Mar. 19, 1885
Tanner, James.....	New York.....	Mar. 27, 1889
Raum, Green B.....	Illinois.....	Oct. 19, 1889
Lochren, William.....	Minnesota.....	Apr. 13, 1893
Murphy, Dominic I.....	Pennsylvania.....	May 28, 1896
Evans, Henry Clay.....	Tennessee.....	Apr. 1, 1897

OFFICIAL ROSTER OF THE BUREAU OF PENSIONS.

Name.	Office.	Whence appointed.
* Henry Clay Evans.....	Commissioner.....	Tennessee.
* James L. Davenport.....	First deputy commissioner.....	New Hampshire.
* Leverett M. Kelly.....	Deputy commissioner.....	Illinois.
William H. Bayly.....	Chief clerk.....	Pennsylvania.
Walter J. Brooks.....	Assistant chief clerk.....	Do.
* Jacob F. Raub.....	Medical referee.....	Do.
Charles F. Whitney.....	Assistant medical referee.....	Illinois.
Stephen A. Cuddy.....	Law clerk.....	Wisconsin.
* Ferdinand D. Stephenson.....	Chief board of review.....	Illinois.
Amos B. Casselman.....	Chief special examination division.....	Missouri.
* Thomas W. Dalton.....	Chief old war and navy division.....	New Jersey.
* Warner Wilhite.....	Chief eastern division.....	Indiana.
Frank A. Warfield.....	Chief middle division.....	Connecticut.
* John S. Garrison.....	Chief western division.....	Michigan.
* Francis H. Allen.....	Chief southern division.....	Wisconsin.
* Gilbert C. Kniffin.....	Acting chief record division.....	Kentucky.
* Adolphus B. Bennett.....	Chief certificate division.....	New York.
Benjamin A. Harlan.....	Chief finance division.....	Michigan.
* John Hancock.....	Chief stationery division.....	Florida.
* T. Mannell Hermann.....	Acting chief mail division.....	Oregon.
* Charles W. Filer.....	Chief army and navy survivors division.....	Connecticut.
George W. Barnes.....	Superintendent of building.....	Pennsylvania.

*Served in Union Army or Navy during the civil war.

NAVY PENSION FUND.

The money accruing to the United States from sale of prizes constitutes a fund which must remain forever a fund for the payment of pensions to the officers, seamen, and marines who may be entitled to receive the same. The law provides that if such fund be insufficient for the purpose the public faith is pledged to make up the deficiency.

It does not appear that there was any navy pension fund in 1861 but in 1862 it amounted to \$1,356,000, and in 1864 to \$6,055,585. It now amounts to about \$14,000,000. The interest on the fund up to 1864 was more than sufficient to pay navy pensions, and in that year a law was passed reducing the interest on said fund to 3 per cent per annum.

Since 1870 the amount derived from the interest on this fund has been inadequate to pay all navy pensions, and the provision which pledges the public faith to make up the deficiency has been brought into operation since that date.

During the past four years the interest on the navy pension fund available for the payment of navy pensions has been as follows:

For 1895	\$339, 53
For 1896	340, 68
For 1897	340, 27
For 1898	341, 27

The amounts paid during said years for navy pensions were as follows:

In 1895	\$3, 655, 485. 5
In 1896	3, 588, 528. 5
In 1897	3, 635, 802. 7
In 1898	3, 723, 932. 5

It will readily appear that the amount of interest on the navy pension fund made available for the payment of navy pensions during the period above noted was in fact less than 10 per cent of the actual payments made in connection with that branch of the service.

In the naval appropriation act of 1870 it was provided that the present and all future appropriations for the support of the United States Naval Asylum at Philadelphia, Pa., should be charged to and paid from the income of the naval pension fund.

This fund is also charged with the payment of the half-pay allowance made to disabled seamen or marines for twenty years' service, and the allowance made by the Secretary of the Navy to disabled persons who have served in the Navy or Marine Corps for a period of ten years. These allowances are separate from and in addition to any pension to which these persons are entitled under existing laws.

WHO ARE ENTITLED TO PENSIONS.

REVOLUTIONARY WAR.

The act of March 18, 1818, thirty-five years after the termination of the Revolutionary war, was the first general act passed granting a pension for service only. Its beneficiaries were required to be in indigent circumstances and in need of assistance.

About 1820 Congress became alarmed at the large number of applicants for pensions under this act (there were about 8,000), and, on May 18, 1820, passed what has been known as the "alarm act," which required all pensioners then on the roll to furnish a schedule of the amount of property then in their possession. Many of the pensioners whose

schedules showed they possessed too much property were dropped from the rolls. Pensioners were dropped who owned as small an amount as \$150 worth of property.

On May 15, 1828, or forty-five years after the war, service pension was granted to those who served to the end of the war of the Revolution.

On June 7, 1832, or forty-nine years after the close of the war, a general law was enacted pensioning all survivors who served not less than six months in said war.

On July 4, 1836, being fifty-three years after the termination of the war, an act was passed granting pension for five years to Revolutionary war widows, provided they were married to the soldier or sailor before the close of his last service and that his service was not less than six months.

On July 7, 1838, or fifty-five years after the close of the war, the above act was amended so as to provide where the marriage took place before January 1, 1794.

On July 29, 1848, or sixty-five years after the war, the above laws were amended to include those who were married prior to January 1, 1800.

On February 3, 1853, or seventy years after the war, an act was passed striking out the limitation as to date of marriage.

WAR OF 1812.

The first law granting pension for service in the war of 1812 was passed February 14, 1871, fifty-six years after the close of the war. This act required sixty days' service, and widows were not entitled unless they were married to soldier or sailor prior to the treaty of peace, February 17, 1815.

The act of March 9, 1878, sixty-three years after the close of the war, reduced the period of service to fourteen days, and made no limitation as to date of marriage in case of widows.

WAR WITH MEXICO.

On January 29, 1887, thirty-nine years after the close of the war, an act was passed providing for soldiers and sailors and their widows for service of sixty days, if 62 years of age, or disabled or dependent.

INDIAN WARS.

On July 27, 1892, fifty years after period included in the act, pension was provided for those who served thirty days in the Black Hawk, Creek, Cherokee, and Florida war with Seminole Indians, from 1832 to 1842, and to their widows.

There has never been any law pensioning widows of soldiers whose death was due to service in time of peace prior to March 4, 1861.

No provision has ever been made for mothers and fathers and brothers and sisters if the death of soldier or sailor resulted from service prior to March 4, 1861.

The laws relating to pension have been more liberal since 1861 than they were prior to that date.

To make it plainer, as an illustration of this fact, I will cite the case of a sailor who lost both arms in the service and line of duty prior to March 4, 1861. He would be entitled to a rating beginning at \$3.50 per month and to the various rates provided from time to time, to February 12, 1889, when he would receive \$100 per month.

ACTS OF JULY 14, 1862, AND MARCH 2, 1873.

Any officer, soldier, sailor, or marine, disabled by reason of wound received or disease contracted in the service of the United States, and in the line of duty, may be pensioned for such disability during its continuance.

In case of his death from causes originating as above set forth, his widow or his child or children under 16 years of age become entitled to pension. If he left no widow or child under 16, his dependent mother, father, or orphan sisters and brothers are entitled in the order named.

ACT OF JUNE 27, 1890.

Any officer, soldier, sailor, or marine who served ninety days or more in the military or naval service of the United States during the late war of the rebellion, who has been honorably discharged therefrom and who is suffering from disability of a permanent character, not the result of his own vicious habits, which incapacitates him from the performance of manual labor in such a degree as to render him unable to earn a support, is entitled to pension under this act of not less than \$6 per month nor more than \$12 per month.

In case of the death of any person named above, his widow becomes entitled to pension, provided she married him prior to June 27, 1890 and that she is without other means of support than her daily labor. If she remarries or dies, the child or children of such soldier or sailor under the age of 16 years become entitled.

ACT OF AUGUST 5, 1892.

All women employed by the Surgeon-General of the Army as nurses during the late war of the rebellion for a period of six months or more and who were honorably relieved from such service, are granted a pension, provided they are unable to earn a support.

SERVICE PENSIONS.

There is no law granting service pension to any person for service rendered since the war with Mexico.

RULES ADOPTED BY THE COMMITTEE ON PENSIONS, UNITED STATES SENATE, JANUARY 11, 1898.

1. Consideration will not be given to any bill which has not first been submitted to the Pension Bureau for adjudication, unless conclusive proof is presented that the claimant has no pensionable status before the Bureau. Claims passed upon by the Bureau, whether allowed or rejected, will not be entertained by this committee until a period of at least one year has elapsed.

2. Where original pension or increase of pension has been allowed by special act, no proposition for additional pension will be entertained by this committee.

3. Bills providing for the payment of arrears will not be considered in any case.

4. Bills proposing to pension children of soldiers will not be entertained except in cases where the child has been idiotic, deformed, or otherwise mentally or physically incapacitated from birth or early childhood, and then only in cases of destitution.

5. Bills for increasing pensions by special act, which have been granted by the Bureau at the maximum rate under the act of June 27,



Expenditures.

	Expended.	Estimated liabilities.	Total.
Salaries	\$688,727.50		\$688,727.
Scientific library	2,260.01	\$739.99	3,000.
Transportation of publications to foreign countries	163.05	(a)	163.
Stationery	8,903.07		8,903.
Postage on foreign matter	1,928.00		1,928.
Furniture	1,916.83		1,916.
Carpets	1,789.45		1,789.
Ice	391.71		391.
Telephones	120.00		120.
Washing towels	88.65		88.
Sundries	11,217.92		11,217.
Official Gazette, illustrations, paid contractor	39,749.40		39,749.
Photolithographing, paid contractor	58,183.74		58,183.
Printing and binding:			
Paid Public Printer—			
Official Gazette, 1897-98	58,039.72		58,039.
Official Gazette indexes, 1897-98		4,961.64	4,961.
Producing indexes, etc., 1896, and index to vols. 78 and 79, of 1897	6,651.97		6,651.
Printing specifications	168,991.93	5,370.00	174,361.
Miscellaneous work	10,286.96	2,878.73	13,165.
Miscellaneous work at branch office	8,273.52		8,273.
Total	1,067,683.43	13,950.36	1,081,633.

a Not accessible.

Receipts and expenditures.

Receipts from all sources	\$1,253,948.
Expenditures (including total in all appropriations)	1,081,633.
Surplus	172,314.

Applications awaiting action.

Number of applications awaiting action on the part of the office on July 1,	
1898	12, 1

Comparative statement.

	Receipts.	Expenditure
June 30, 1890	\$1,347,203.21	\$1,081,173.
June 30, 1891	1,302,794.59	1,145,502.
June 30, 1892	1,268,727.35	1,114,134.
June 30, 1893	1,288,809.07	1,111,444.
June 30, 1894	1,183,523.18	1,053,962.
June 30, 1895	1,195,557.07	1,038,166.
June 30, 1896	1,307,090.30	1,097,368.
June 30, 1897	1,345,779.44	¹ 1,088,473.
June 30, 1898	1,253,948.44	1,081,633.

¹ Corrected as per statement rendered by the Department on July 14, 1898, showing that the expenditures during the year 1897 on account of printing and binding were \$275,357.47, instead of \$213,528.7 the amount furnished this office by the Department on August 26, 1897.

Applications for patents, including reissues, designs, trade-marks, labels, and prints.

June 30, 1890	43, 8
June 30, 1891	43, 6
June 30, 1892	43, 5
June 30, 1893	43, 5
June 30, 1894	39, 2
June 30, 1895	41, 0
June 30, 1896	45, 6
June 30, 1897	47, 7
June 30, 1898	44, 1

in the manufacture of patented inventions, but to the general public interested, as everyone is, in the early issue of valid rather than worthless patents. The attention of the office is now directed to formulating the best possible plan for remedying the defects in the present system of classification, and making such changes and additions as may be determined to be the most practicable and efficacious for correcting the imperfections in the present system.

While referring to this subject, I wish to express to you not only my own satisfaction, but also the gratification felt by the friends of the American patent system for the intelligent, prompt, and cordial assistance you have given to the efforts made by us to secure an adequate working force. It will be a unique experience for the Commissioner of Patents in submitting the estimates of appropriations for the next fiscal year not to be obliged to ask for an increase in force. For years such appeals have been made in vain. This year they will not have to be made at all.

COPYISTS AT \$720.

I shall, however, in submitting the estimates recommend that our seventy-six copyists, now receiving \$720, be paid \$900, the same salary paid in other departments and bureaus. This will not only be an act of common justice, but is necessary if we are to retain a permanent force of skilled stenographers and typewriters such as is essential for our needs. Many of our best assistants in this line are transferred to other offices to the distinct detriment of this. The amount required to equalize these salaries will be \$13,680.

RESIGNATIONS.

During the past six months thirteen members of the examining corps have resigned. These resignations cripple the force, as it is a long time before new and inexperienced men can render equally efficient service. These frequent changes in the force of this office are an evil of no small magnitude. While a majority of these have resigned for the purpose of going into business, some, actuated by the spirit of patriotism and a sense of duty, have tendered their services to their country and are now rendering efficient aid at the front. Such will be welcomed back at the successful termination of the present war.

Respectfully, yours,

C. H. DUELL,
Commissioner.

The SECRETARY OF THE INTERIOR.

REPORT OF THE COMMISSIONER OF RAILROADS.

DEPARTMENT OF THE INTERIOR,
OFFICE OF COMMISSIONER OF RAILROADS,
Washington, D. C., November 1, 1898.

SIR: In compliance with the provisions of the act of Congress creating this Bureau, approved June 19, 1878 (20 Stat., 169, sec. 3), I have the honor to submit the following report for the year ended June 30, 1898, on the physical and financial condition of the property and affairs of the several railroad companies which have received subsidies from the United States, and which have submitted such reports as have been called for under the law.

RAILROAD OPERATIONS.

The long period of financial depression, which commenced in 1893, continuing throughout the succeeding three years, and culminating in 1896, has disappeared. Cheerfulness has supplanted distrust, and the old feeling of confidence which prevailed before the fear of tight money arose has returned with renewed strength and with every prospect of continuance. The business of the country generally has been steadily expanding for the past fifteen months. This is an established fact, observable in almost every channel of industry, and particularly so in railroad affairs.

When the industries of our country are active and business is good, railway traffic is large and the masses of the people are employed. This is the condition of our country to-day, and it is almost an ideal condition of national prosperity. In the railroad situation we have the spectacle of roads, which only two or three years ago were in receivers' hands, now paying dividends on their preferred stocks and piling up surpluses, which, in the course of a very short time, will be distributed among the common shareholders. The physical conditions of our railroads, generally, are better than ever before; they are better equipped, both physically and financially, than at any time in their history.

Many railroads, which in 1893, on account of the stringency of the times, were forced to cut the salaries of officers and employees 20 per cent, have voluntarily restored the old basis of wages.

In April, 1894, receivers controlled in this country 210 roads, embracing about 20 per cent of the total mileage of the United States. On June 30 of this year there were only 119 railroads in the hands of receivers, and it is safe to predict, under the present condition of prosperity, that within another year the list of insolvent railroads will be as small as it was in the years immediately preceding 1893.

CONDITION OF THE PROPERTIES.

During the months of August and September of this year I personally inspected the properties of the Union Pacific and Central Pacific Railroad companies, and several of the land-grant lines in the West and on the Pacific slope. On account of the reduction in the allowance for traveling expenses, it has not been possible for me or the force of this Bureau to actually inspect all the physical conditions of the roadbed, shops, equipment, etc., of each of the various lines of railroad coming within the jurisdiction of this office, and to report thereon as required by the act creating this Bureau. However, of the roads I inspected, I traveled over them only in the daytime, and was enabled to gain a fair idea of the present condition of the properties. Substantial improvements have been made in the roadbed on the main lines, heavy steel rails have taken the place of iron rails, wooden bridges are being replaced by others of iron and steel, and the ballasting is more extensive and much improved.

During the month of May of this year I, with the assistant book-keeper, visited the general offices of the bond-aided railroad companies in New York and Boston, and the books and accounts were thoroughly examined and the amounts due the United States from each, under the acts of 1862, 1864 and 1878, carefully computed and ascertained.

NEW STRENGTHENING CONDITIONS.

The annexation of the Hawaiian Islands—the possible, probable control of the Philippine and Ladrone islands—must open up new trade relations of such growing proportions with them as to so materially increase the business of all the bond-aided roads, as to be well within the scope of reason to anticipate their ability, at an early date, to pay principal and interest of their debt to the United States.

These new eastern possessions, with Cuba and Porto Rico, producing tropical products—our annual demand for which is to the extent of \$225,000,000 (about one-third of our entire imports)—will, in a few years, be entirely furnished from these new possessions and our own products taken in exchange, while now our exports to these islands, I believe, do not exceed \$15,000,000 annually.

Heretofore, under former sway, every effort has been made to discourage business intercourse with Americans. Under the new order of things in these islands every effort will be made to encourage trade with us, and when the population is doubled in numbers, and is increased ten times in ability to produce and consume, which is not an unreasonable anticipation, what then will our trade amount to? It is almost impossible to imagine.

Less than 5,000,000 British colonists in Australasia exchange products to the amount of \$650,000,000 annually. It is only reasonable to suppose that in a few years the trade with our new possessions will fully equal, if it will not surpass, all this, of which the United States must and will control the bulk.

Furthermore, in my judgment, the vast volumes of wheat and other cereals which now find their way from the Middle Western grain prairies to Asia and other countries of the Western Hemisphere, via the Atlantic seaports, will, in a very few years, reach these same destinations via Pacific seaports, and with this changed condition will come vastly increased tonnage and revenues to all the transcontinental lines. The diversion of this very traffic on this idea is now receiving the careful attention and consideration of the executive and managing officials of some of the leading lines between Chicago, St. Paul, and other Middle Western grain centers and the Pacific slope, and therefore it seems to me the interest the United States has in bond-aided railroads, and especially in the Central Pacific Railroad, should not be "scaled," but that we have every reason to look for repayment of dollar for dollar, principal and interest, loaned or advanced by the Government originally to these corporations.

GOVERNMENT LINE TO THE PACIFIC COAST.

It may be timely just now to suggest that the Government construct and operate a first-class double-track railway from Kansas City, Mo., to San Diego, Cal., by air-line route. This will open the shortest line, measured by the map, from Boston, New York, and Philadelphia to the Pacific coast, along and near the coal fields of the east, and the west of this side of the Rockies, and making the most direct line from our great commercial centers to the Sandwich Islands and the Philippines.

This, with other lines now working overland, may prove ample for the wants of commerce to the Pacific coast and the Orient, holding trade and travel within our borders pending the experiment of a canal through the fevered climate of the Isthmus.

An overland route from Vera Cruz, Mexico, to Accapulco, now approaching completion, may be an important adjunct to our own overland routes as commerce increases.

The home advantages of an overland line by the Government will be to draw the people nearer together in interests and sympathies, and will

serve them as a safeguard against the monopoly of corporations. As trade increases it may develop the importance of a direct and similar line to Seattle, in Washington State.

St. Louis, Mo., is a little south of the direct line between New York and San Diego, but the topographical features of the country indicate that possibly a better route may be found from that point, and the bridge over the Mississippi River at St. Louis may prove an important consideration. A survey, therefore, by direct lines should be made from each of these points.

On July 7, 1898, Congress enacted the following, which was one of the provisions of the general deficiency bill:

SETTLEMENT WITH THE CENTRAL PACIFIC AND WESTERN PACIFIC RAILROADS: That the Secretary of the Treasury, the Secretary of the Interior, and the Attorney-General, and their successors in office, be, and they are hereby, appointed a commission with full power to settle the indebtedness to the Government growing out of the issue of bonds in aid of the construction of the Central Pacific and Western Pacific bond-aided railroads, upon such terms and in such manner as may be agreed upon by them, or by a majority of them, and the owners of said railroads: *Provided*, That any and all settlements thus made shall be submitted in writing to the President for his approval or disapproval, and unless approved by him shall not be binding.

That said commission shall not agree to accept a less sum in settlement of the amount due the United States than the full amount of the principal and interest and all amounts necessary to reimburse the United States for moneys paid for interest or otherwise: *And also provided*, That said commission are hereby empowered to grant such time or times of payment by installment, and at such rates of interest, to be not less than three per centum per annum, payable semiannually, and with such security as to said commission may seem expedient: *Provided, however*, That in any settlement that may be made the final payment and full discharge of said indebtedness shall not be postponed to exceed ten years and the whole amount, principal and interest, shall be paid in equal semiannual installments within the period so limited, and in any settlement made it shall be provided that if default shall be made in any payment of either principal or interest or any part thereof then the whole sum and all installments, principal and interest, shall immediately become due and payable, notwithstanding any other stipulation of said settlement: *Provided further*, That unless the settlement herein authorized be perfected within one year after the passage of this act, the President of the United States shall at once proceed to foreclose all liens now held by the United States against said railroad companies and to collect the indebtedness herein sought to be settled, and nothing in this act contained shall be held to waive or release any right, lien, or cause of action already held by the United States.

That there is hereby appropriated, out of any money in the Treasury not otherwise appropriated, the sum of twenty thousand dollars to defray the expenses of said commission in making the said settlement.

It is anticipated that an early date the commission will take action on the above law.

Particular attention is invited to the following statement showing the increase of net earnings of the different railroads over those of last year:

Union Pacific Railway.....	\$1, 395, 017. 08
Central Pacific.....	1, 566, 134. 97
Sioux City and Pacific	72, 748. 85

Central Branch Union Pacific	\$57, 123. 44
Atchison, Topeka and Santa Fe	2, 263, 847. 77
Chicago and North-Western	989, 262. 14
Chicago, Burlington and Quincy	1, 785, 073. 19
Chicago, Milwaukee and St. Paul	1, 078, 868. 16
Chicago, Rock Island and Pacific	1, 418, 792. 18
Chicago, St. Paul, Minneapolis and Omaha	33, 930. 60
Dubuque and Sioux City	216, 556. 20
Hannibal and St. Joseph	40, 497. 67
Little Rock and Memphis	58, 891. 84
Missouri, Kansas and Texas	641, 214. 53
Missouri Pacific	587, 854. 94
Northern Pacific	6, 382, 751. 71
Oregon and California	477, 907. 99
St. Louis and San Francisco	320, 044. 17
St. Louis, Iron Mountain and Southern	914, 387. 46
St. Paul and Duluth	63, 577. 83
Southern Pacific of California	2, 582, 204. 26
Texas and Pacific	426, 440. 75
Wisconsin Central	139, 492. 06

Total increase of net earnings..... 23, 514, 619. 79

Of the subsidy bonds which were issued by the United States under the acts of 1862 and 1864 to aid in the construction of the several Pacific railroads there have matured \$50,618,952, and \$50,489,952 of these bonds have been redeemed and paid out of the cash in the Treasury of the United States, leaving still due and unpaid \$129,000, as is shown in detail by the following statement:

	Amount.	Redeemed.	Due and unpaid.
Union Pacific:			
Matured February 1, 1896	\$4, 320, 000	\$4, 310, 000	\$10, 000
Matured January 1, 1897	3, 840, 000	3, 840, 000	.....
Matured January 1, 1898	15, 919, 512	15, 858, 512	61, 000
	24, 079, 512	24, 008, 512	71, 000
Kansas Pacific:			
Matured November 1, 1895	640, 000	685, 000	5, 000
Matured January 1, 1896	1, 440, 000	1, 437, 000	3, 000
Matured January 1, 1897	2, 800, 000	2, 800, 000	.....
Matured January 1, 1898	1, 423, 000	1, 419, 000	4, 000
	6, 303, 000	6, 291, 000	12, 000
Central Branch Union Pacific:			
Matured January 1, 1896	640, 000	640, 000	.....
Matured January 1, 1897	640, 000	640, 000	.....
Matured January 1, 1898	320, 000	320, 000	.....
	1, 600, 000	1, 600, 000	.....
Central Pacific:			
Matured January 16, 1895	2, 362, 000	2, 362, 000	.....
Matured January 1, 1896	1, 600, 000	1, 600, 000	.....
Matured January 1, 1897	2, 112, 000	2, 112, 000	.....
Matured January 1, 1898	10, 614, 120	10, 573, 120	41, 000
	16, 688, 120	16, 647, 120	41, 000
Western Pacific: Matured January 1, 1897	320, 000	320, 000	.....
Sioux City and Pacific: Matured January 1, 1898	1, 628, 320	1, 623, 320	5, 000
Total.....	50, 618, 952	50, 489, 952	129, 000

The remaining bonds of the above issue fall due as follows:

Union Pacific, January 1, 1899	\$3, 157, 000
Central Pacific, January 1, 1899	9, 197, 000
Western Pacific, January 1, 1899	1, 650, 560

Total 14, 004, 560

Payments have been anticipated and redemptions made by the Secretary of the Treasury on the bonds maturing January 1, 1899, as follows:

Union Pacific	\$254, 000
Central Pacific	624, 000
Western Pacific	40, 000

Total 918, 000

The tabulated statement given below shows (1) the principal of the bonds originally issued by the United States to the several railroad companies; (2) the unreimbursed interest paid on same by the United States; (3) amounts due from the United States to the several railroad companies, and (4) the balance of indebtedness of the companies on June 30, 1898:

Name of road.	Principal.	Interest.	Total.
Central Pacific	\$25, 885, 120. 00	\$36, 573, 623. 97	\$62, 458, 743. 97
Western Pacific	1, 970, 560. 00	3, 403, 585. 94	5, 374, 145. 94
Central Branch Union Pacific	1, 600, 000. 00	2, 167, 468. 46	3, 767, 468. 46
Sioux City and Pacific	1, 628, 320. 00	2, 604, 088. 39	4, 232, 408. 39
Total	31, 084, 000. 00	44, 748, 766. 76	75, 832, 766. 76

Due from the United States.				Balance due the United States.
Name of road.	Judgments and allowed claims.	Bonds and un-invested cash in sinking fund.	Total.	
Central Pacific	\$1, 162, 939. 48	\$7, 662, 650. 30	\$8, 825, 589. 78	\$53, 633, 154. 19
Western Pacific				5, 374, 145. 94
Central Branch Union Pacific				3, 767, 468. 46
Sioux City and Pacific				4, 232, 408. 39
Total	1, 162, 939. 48	7, 662, 650. 30	8, 825, 589. 78	67, 007, 176. 98

NOTE.—The Government has been reimbursed for \$27,236,512 principal and \$31,211,711.75 interest, being the total indebtedness of the Union Pacific Railroad Company to November 1, 1897, and for the principal of the Kansas Pacific indebtedness, amounting to \$6,303,000.

BOND-AIDED ROADS.

UNION PACIFIC RAILROAD COMPANY.

The pecuniary interests of the Government in the Union Pacific Railroad terminated on November 1, 1897, when its main line was sold to the purchasing trustees of the Union Pacific reorganization committee, under a decree of the United States court for the district of Nebraska. The bids of the trustees, which were accepted and the sale confirmed on November 6, 1897, covered the entire indebtedness to the

United States to November 1, 1897, including the \$13,645,250, in bonds at par then held by the Secretary of the Treasury for the Union Pacific sinking fund. The amount due the Government consisted of the following items:

Principal of debt	\$27,236,512.00	
Balance of interest paid by United States	30,830,181.51	
Interest accrued and not yet paid (four months).....	381,530.24	
Total debt		\$58,448,223.75
Credit:		
Cash in sinking fund	4,537,921.39	
Bonds in sinking fund, at par.....	13,645,250.00	
Interest due November 1, 1897, on bonds in sinking fund.....	11,446.87	
Total		18,194,618.26
Balance due		40,253,605.49

This balance was required to be paid in four equal installments within thirty, forty, fifty, and sixty days, respectively, after confirmation of sale, all of which payments have been made. The amounts actually realized by the United States from the said sales and from the provisions in the decree are as follows:

Amount paid for railroad, franchises, and property.....	\$40,253,605.49
For securities in sinking fund.....	13,645,250.00
Cash in sinking fund applied.....	4,537,921.39
Interest collected November 1, 1897, on bonds in sinking fund.....	11,446.87
Total amount realized	58,448,223.75

A second foreclosure suit instituted by the United States against the Union Pacific Railway Company and others, for the foreclosure of the mortgages on the bond aided portion of the Kansas Pacific, was prosecuted to a final decree, and this road was sold on the 16th day of February, 1898, to Louis Fitzgerald and Alvin W. Krech, as purchasing trustees, for the sum of \$6,303,000, which amount has been duly paid into the Treasury of the United States. The purchasing trustees duly transferred and assigned their bid, and all their rights as bidders and purchasers of said railroad, franchises, and property, to the Union Pacific Railroad Company.

In the decrees for the sale of the Union division and the Kansas division it is stipulated that they are sold subject to the following provision:

"Saving and excepting the right of the United States Government to have the preference at all times in the use, at fair and reasonable rates of compensation, not to exceed the amounts paid by private parties for the same kind of service, of the said telegraph line and railroad for the transmission of dispatches over said telegraph line and the transportation of mails, troops and munitions of war, supplies, and public stores upon said railroad for the Government whenever required by any department thereof."

The entire indebtedness of the Kansas Pacific Railroad Company to the United States was \$12,891,900.19. There remains, after deducting \$6,303,000, the amount realized from the sale, a balance of \$6,588,900.19 still due the United States. Proceedings have been instituted against the Union Pacific Railway Company by the Department of Justice in the circuit court of the United States for the district of Nebraska, by which it claimed that the United States be allowed the said principal sum of \$6,588,900.19, together with interest upon the sum of \$12,891,900.19 from April 1, 1897, to February 16, 1898, and also interest on \$6,588,900.19 from February 16, 1898. An amount of securities and assets which are not covered by any specific lien or incumbrance are involved in this sequestration suit. It is believed that this amount will exceed \$4,000,000. The claims presented by all parties approximate a total of \$60,000,000.

The Union Pacific Railroad Company was incorporated June 23, 1897, and has become the successor to the lines of the Union Pacific Railway Company. The entire main line was opened to public business April 15, 1898.

By the acts of 1862 and 1864 lands were granted by the United States to the companies forming the present corporation as follows:

	Acres.
Union Pacific	12,000,000
Kansas Pacific	6,000,000
Denver Pacific Railway and Telegraph.....	1,400,000
Total.....	19,400,000

The following points are the land-grant termini: Union Pacific, Bridge Junction, Omaha, Nebr., and Union Depot, Ogden, Utah; Kansas Pacific, Kansas City, Mo., and a point on the railroad between Monument and Gopher stations and Eighteenth street, Denver, Colo.; Denver Pacific, Denver, Colo., and Cheyenne, Wyo.

The records of the General Land Office show that during the fiscal year there were patented to this company 291,291.19 acres. The number of acres patented to June 30, 1898, as shown by the books of the General Land Office is as follows:

Union Pacific:	Acres.	Acres.
In Colorado.....	507,072.63	
In Nebraska.....	4,782,753.51	
In Wyoming.....	1,360,467.86	
In Utah.....	341,520.29	
	<hr/>	6,991,814.29
Kansas Pacific:		
In Kansas.....	2,940,058.41	
In Colorado.....	192,018.38	
	<hr/>	3,132,076.79
Denver Pacific, Colorado.....		453,267.06
Total.....		10,577,158.14

The company makes the following report of the operations of its land department:

	Union Pacific.	Kansas Pacific. <i>a</i>	Denver Pacific. <i>b</i>	Total.
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Acquired by United States patent...	6,991,942.28	3,227,642.09	442,152.29	10,661,737.26
Acquired by cancellation of contracts	2,128,607.01	669,204.36	74,897.51	2,862,708.88
Disposed of for cash and on time contracts <i>c</i>	9,783,487.76	4,153,048.52	<i>d</i> 591,467.63	14,528,003.91
Total cash receipts from all sales....	\$23,013,465.44	\$13,626,691.06	\$2,239,871.50	\$38,880,058.00
Amount outstanding on account of time sales.....	2,344,300.16	2,792,418.24	447,917.91	5,584,636.31
Receipts during the year.....	118,902.93	143,960.12	21,891.74	284,754.79
Expenses during the year.....	79,919.53	21,869.20	11,334.57	113,123.30
Surplus.....	38,983.40	122,090.92	10,557.17	171,631.49
Average price per acre for all sales to date.....	2.46	4.16	4.45	.....
Average price per acre now asked....	.65	2.50	2.30	.....

a To May 31, 1898.
b To March 31, 1898.

c Includes land sold but not yet patented.
d Not including 480 acres reclaimed by United States.

At the close of the fiscal year the total number of miles operated was 1,849.29, being 27 miles in excess of the mileage of the former Union Pacific Railway. The track is laid with steel rails of various weights, from 52 to 75 pounds per yard. The cross-ties are of oak, fir, pine, and cedar, and average 2,952 to the mile. Their average price at present is 43 cents. The track is fenced for 879 miles. The ballast consists of 22.65 miles of stone, 163.20 miles of gravel, 133.63 miles of cinder, 23.03 miles of burnt clay, 17.97 miles of crushed slag, and 1,495.85 miles of natural soil. The bridges aggregate in length 91,564 feet.

The assessed valuation of roadway, bridges, track, buildings, rolling stock, etc., for taxation, averages \$10,332 per mile, or a total of \$9,106,265.

During the summer, part of the properties of this company were inspected by myself and another official of this office. The roadbed and equipment show improvement over the previous year, and the property is in good condition. The express business is transacted by the Pacific Express Company, the railway company receiving 50 per cent of the gross earnings.

The five miles of track from Ogden, Utah, to the western terminus of the road are leased to the Central Pacific Railroad Company under a contract dated February 10, 1888, for a consideration of \$20,000 per annum.

Comparative statement of earnings and expenses.

	Year ended—		Difference.	
	June 30, 1898.	June 30, 1897.	Increase.	Decrease.
EARNINGS.				
Passenger	\$2,680,622.49	\$2,377,469.99	\$303,152.50	
Freight	12,650,045.15	10,652,760.64	1,997,284.51	
Mail	1,167,203.93	1,167,450.99		\$247.06
Express	252,043.22	203,035.55	49,007.67	
Miscellaneous	634,102.17	543,760.19	90,341.98	
Total	17,384,016.96	14,944,477.36	2,439,539.60	
EXPENSES.				
Maintenance of way and structures.....	1,942,724.96	1,883,099.88	60,625.08	
Maintenance of equipment.....	2,131,358.90	2,047,167.18	84,191.72	
Conducting transportation.....	5,383,115.86	5,024,774.39	358,341.47	
General expenses and taxes.....	1,603,119.16	1,061,754.91	541,364.25	
Total	11,061,318.88	10,016,796.36	1,044,522.52	
Net earnings.....	6,322,698.08	4,927,681.00	1,395,017.08	
Miles operated.....	1,849.29	1,822.29	27.00	
Earnings per mile.....	\$9,400.37	\$8,200.93	\$1,199.44	
Expenses per mile.....	5,981.38	5,496.81	484.57	
Net earnings per mile.....	3,418.99	2,704.12	714.87	
Percentage of expenses to earnings.....	63.64	67.03		3.39

*Revenue and expenditures for year.***REVENUE.**

Earnings	\$7,670,579.30	
Dividends on stocks of other companies	79,685.50	
Interest on bonds of other companies	506,939.77	
Interest on miscellaneous investments	17,835.53	
Discount and interest	1,981.80	
Total.....		\$8,277,021.90

EXPENDITURES.

Operating expenses and taxes	\$4,534,418.16	
Profit and loss, taxes.....	145,918.24	
Interest on first-mortgage bonds.....	1,800,000.00	
New equipment.....	307,276.00	
Total.....		6,787,612.40
Surplus.....		1,489,409.50

*General balance sheet.***ASSETS.**

Cost of road and fixtures.....	\$214,961,582.00	
Cost of equipment	5,402,401.95	
Fuel, material, and stores on hand.....	961,485.20	
Cash on hand	5,889,291.09	
Stocks, bonds, and miscellaneous investments.....	7,252,961.84	
Accounts receivable	1,343,442.41	
Due from other companies, account traffic.....	182,762.77	
Securities held in trust.....	199,400.00	
Total		\$236,193,327.26

LIABILITIES.

First-mortgage bonds	\$95,000,000.00
Interest on same, due and accrued.....	1,800,000.00
Other funded debt	11,000.00
Interest on other funded debt, due and unpaid.....	275.00
Accounts payable	722,750.32
Pay rolls and vouchers	862,616.44
Capital stock	136,000,000.00
Total	\$234,396,641.76
Surplus.....	1,796,685.50

CENTRAL PACIFIC RAILROAD COMPANY.

This company was originally chartered June 28, 1861, as the Central Pacific Railroad of California. On June 23, 1870, it was consolidated with the Western Pacific Railroad Company under the name of the Central Pacific Railroad Company. By another consolidation, on August 22, 1870, with the California and Oregon Railroad (organized January 16, 1868), the San Francisco, Oakland and Alameda Railroad (organized October 15, 1868), and the San Joaquin Valley Railroad (chartered February 5, 1868), the present company was formed. The road of this company is now operated by the Southern Pacific Company under a lease for ninety years from January 1, 1894, by the terms of which the operating company pays from the earnings all the expenses of operation, fixed and other charges, including sinking fund and United States requirements, and \$10,000 yearly for organization expenses, the Central Pacific to receive net earnings up to 6 per cent of the stock, and all excess to be equally divided between the companies.

Under the acts of July 1, 1862 (12 Stat., 489), and July 2, 1864 (13 Stat., 356), thirty-year 6 per cent bonds were issued by the United States to aid in the construction of the Central Pacific, amounting to \$25,885,120, and of the Western Pacific, amounting to \$1,970,560, making a total of \$27,855,680, which are secured by second mortgage on the properties, the company's first mortgage being a prior lien to that of the United States. The aided portion of the road, to which under court decisions the lien of the Government is confined, extends from the junction with the Union Pacific, near Ogden, Utah, to Sacramento, Cal., thence via Niles to San Jose, Cal.

Under the acts of July 1, 1862, July 2, 1864, and July 25, 1866, the roads which form the present company received from the United States grants of land to aid in construction as follows:

	Acres.
Central Pacific	8,000,000
Western Pacific.....	1,000,000
Oregon Branch Central Pacific (California and Oregon).....	3,500,000
Total	12,500,000

Ogden, Utah., and Sacramento, Cal.; Brighton and Niles, Cal.; Niles and San Jose, Cal.; junction with Central Pacific Railroad and the southern boundary of Oregon are the land grant termini. The records

of the General Land Office show that to June 30, 1898, there had been patented to the—

Central Pacific:	Acres.
In California	641,963.88
In Nevada	866,413.75
In Utah	1,143,792.49
In Idaho	8,094.24
	<hr/> 2,660,269.36
Western Pacific Railroad Company, in California	451,770.64
Oregon Branch, Central Pacific Railroad Company, in California	2,983,739.41
Total	<hr/> 6,095,779.41

Pursuant to directions of the honorable Secretary of the Interior dated July 15, 1897, the Commissioner of the General Land Office suspended the issuance of patents to the Central and Western Pacific Companies, except for lands actually sold to bona fide purchasers before default was made in the payment of the indebtedness of these companies to the United States. The date of default, as fixed by the Secretary in accordance with the decision of the Attorney-General dated March 25, 1895, was January 1, 1896, for the Central Pacific, and January 1, 1897, for the Western Pacific.

The report of the company shows that to June 30, 1898, there had been acquired by the United States patent to the Central Pacific 2,465,969.70 acres, and to the California and Oregon 2,993,542 acres, making a total of 5,465,511.70 acres. Of this acreage there had been disposed of for cash and on time contracts 3,182,107.70 acres. The total cash receipts from all sales to date amounted to \$10,405,931.60, and there were outstanding on account of time sales \$564,008.35. The receipts from this department during the year amounted to \$216,296.19. The average price per acre now asked is \$3.

	MILEAGE.	
Main line:		Miles.
Oakland wharf, California to Ogden, Utah		872.08
San Francisco to Oakland wharf (ferry)		3.69
Branch lines:		Miles.
Roseville Junction, Cal., to Oregon State line	296.58	
Lathrop to Goshen, Cal.	146.08	
San Jose to Niles, Cal.	17.53	
Oakland pier to East Oakland, Cal.	4.84	
Oakland pier to Melrose, Cal.	8.12	
Mastick to Alameda wharf, Cal.	1.25	
Fernside to East Oakland, Cal.	1.98	
Drawbridge to First and Alice streets .....	.11	
		<hr/> 476.49
Leased lines:		
Brighton to Sacramento, Cal.	5.64	
Ogden, Utah, to point 5 miles west of Ogden.	5.00	
		<hr/> 10.64
Total length of road		1,362.90
Length of double track		9.51
Length of sidings		348.21
Total length of track		<hr/> 1,720.62

With the exception of 4.84 miles the track is entirely laid with steel rails of various weights from 50 to 76 pounds. There are 1,194.34 miles of fencing, including 32.08 miles of snowsheds. During the year 207,448 feet of new 75-pound steel rails, aggregating 2,315.30 tons, were laid at a cost of \$84,340.80, and 466,927 new redwood and pine cross-ties (of which 285,127 were treated) were placed in the track at a cost of \$259,454.02. The additions and betterments to railway, etc., charged to income account, amounted to \$162,250.47.

The rolling stock at the close of the year consisted of 304 locomotives and 340 cars in the passenger, 5,188 in the freight, and 200 in the miscellaneous departments, respectively.

The assessed valuation on June 30, 1897, of roadway, bridges, track, buildings, etc., for taxation, was \$23,972,426, or an average of \$17,508.94 per mile.

The properties of the company, including both the bond-aided and land-grant portions were inspected by me during the summer, particular attention having been given to the aided line, over which I traveled by day. The road has been maintained up to its usual high standard; the track was found in very good condition as regards both surface and line. The roadbed is in good shape, an absence of low or narrow banks being noticeable. The company has continued its policy of substituting steel for wood in important bridge structures, three steel bridges having been erected during the past year, replacing wooden bridges. The heavy traffic, necessitating the use of powerful locomotives, has dictated this step. The main and second tracks are entirely laid with steel rails.

The very heavy fall of snow on the Sierras has made necessary the construction and maintenance of a large number of snowsheds, which completely cover the track, and in many cases extend a long distance up the sides of the mountains. The total length of these sheds is over 32 miles. As a means of protection against destruction by fire, there has been established throughout the sheds a system of fire patrol, with an electric fire-alarm system.

The bond-aided portion of this road extends from a point 5 miles west of Ogden to San Jose, a distance of 864.92 miles. A statement showing the status of the company's indebtedness to the United States, bonds and uninvested cash in sinking fund, etc., will be found elsewhere in this report. Arrangements have been made whereby the principal of the first-mortgage bonds shall become due as follows: Series A, on December 1, 1898; series B, C, and D, on December 1, 1899, series E, on June 1, 1900, and series F, G, H, and I, on June 1, 1901.

The following statements show the funded debt, the operations for the year, and the company's balance sheet on June 30, 1898:

Comparative statement of funded debt of the Central Pacific Railroad Company.

Character of bonds.	Term of bonds.		Rate of interest.	Amount of bonds outstanding.		Lien.
	Years.	Date of maturity.		June 30, 1898.	June 30, 1897.	
<i>Central Pacific Railroad Company.</i>						
First mortgage, series A.....	30	a 1895	Per cent.	\$2,995,000	\$2,995,000	Road and franchise, Sacramento to State line.
B.....	30	b 1896	6	1,000,000	1,000,000	Do.
C.....	30	c 1896	6	1,383,000	1,383,000	Do.
D.....	30	d 1897	6	3,996,000	3,996,000	Road and franchise, California State line to 5 miles west of Ogden.
E.....	30	e 1898	6	3,999,000	3,999,000	Do.
F.....	30	f 1898	6	3,999,000	3,999,000	Do.
G.....	30	g 1898	6	3,510,000	3,511,000	Do.
H.....	30	h 1898	6	25,885,120	25,885,120	Road and franchise, Sacramento to 5 miles west of Ogden.
I.....	30	i 1898	5	5,982,000	5,982,000	Road and franchise, Roseville Junction to Oregon State line.
United States subsidy, second mortgage.....	30	1895-1898				
First mortgage, series A, California and Oregon, extended.....	30	1918	5	4,358,000	4,358,000	Do.
First mortgage, series B, California and Oregon, extended.....	26	1900	5	2,399,000	2,399,000	First mortgage Central Pacific and California and Oregon lands.
Land-grant bonds, extended.....	10	1936	6	56,000	56,000	Lands granted by United States and all other property except added.
Fifty-year bonds.....	50	1939	5	12,283,000	12,283,000	Lands granted and all other property.
Do.....	50					
<i>Western Pacific Railroad Company.</i>						
Old issue.....	30	e 1895	6	111,000	111,000	Road and franchise, Sacramento to San Jose.
First mortgage, series A.....	30	1899	6	1,859,000	1,859,000	Do.
B.....	30	1899	6	765,000	765,000	Road and franchise, Niles to Oakland.
United States subsidy, second mortgage.....	30	1895-1898	6	1,970,560	1,970,560	Road and franchise, Sacramento to San Jose.
<i>San Joaquin Valley Railroad Company.</i>						
First mortgage.....	30	1900	6	6,080,000	6,080,000	Road and franchise, Lathrop to Goshen.
Total.....				87,434,680	87,630,680	

a Extended to December 1, 1898.
 b Extended to December 1, 1899.
 c Extended to June 1, 1900.

d Extended to June 1, 1901.
 e Taken up in 1895 by issue of first mortgage bonds, series A.

Comparative statement of earnings and expenses.

	Year ended—		Difference.	
	June 30, 1898.	June 30, 1897.	Increase.	Decrease.
EARNINGS.				
Passenger	\$4, 575, 224. 61	\$3, 888, 878. 96	\$686, 345. 65	
Freight	9, 743, 037. 88	7, 432, 139. 42	2, 320, 898. 46	
Mail	670, 285. 82	669, 761. 48	524. 34	
Express	237, 260. 45	208, 196. 32	29, 064. 13	
Miscellaneous	576, 402. 76	537, 100. 02	39, 242. 74	
Total	15, 802, 211. 52	12, 726, 136. 20	3, 076, 075. 32	
EXPENSES.				
Maintenance of way and structures	1, 676, 312. 74	1, 404, 128. 21	272, 184. 53	
Maintenance of equipment	1, 755, 341. 70	1, 375, 862. 16	379, 479. 54	
Conducting transportation	5, 393, 953. 96	3, 979, 443. 22	1, 414, 510. 74	
General expenses and taxes	916, 007. 98	1, 472, 242. 44		\$556, 234. 46
Total	9, 741, 616. 38	8, 231, 676. 03	1, 509, 940. 35	
Net earnings	6, 060, 595. 14	4, 494, 460. 17	1, 566, 134. 97	
Miles operated	1, 362. 91	1, 362. 91		
Earnings per mile	\$11, 594. 46	\$9, 337. 47	\$2, 256. 99	
Expenses per mile	7, 147. 66	6, 039. 77	1, 107. 89	
Net earnings per mile	4, 446. 80	3, 297. 70	1, 149. 10	
Percentage of expenses to earnings	61. 64	64. 68		3. 04

Revenue and expenditures for year.

REVENUE.	
Earnings	\$15, 802, 211. 52
Profits on stocks of other companies	27, 112. 53
Interest on investments	30, 515. 16
Receipts of the land department	270, 459. 79
Interest on sinking fund of company	613, 489. 18
Rental from lessee	10, 000. 00
Miscellaneous	32, 000. 00
Rentals	\$49, 662. 96
Less (included in earnings)	35, 862. 86
	13, 800. 10
Total	\$16, 799, 588. 28
EXPENDITURES.	
Operating expenses and taxes	\$9, 741, 616. 38
Interest on first-mortgage bonds	3, 149, 087. 50
Rentals	80, 776. 04
Replacement of rolling stock	183, 935. 00
Administration expenses	51, 151. 47
Sinking fund requirement, company	235, 000. 00
New construction and equipment	162, 250. 47
Expenses of the land department	154, 242. 88
United States sinking fund requirement	885, 817. 41
Land receipts paid trustees of land mortgage	254, 036. 29
Commission for extending bonds	319, 654. 67
Expenses in connection with extension of bonds	695, 274. 32
Payment to sinking funds	613, 489. 18
Old accounts charged off	44, 813. 69
Total	16, 571, 145. 30
Surplus	228, 442. 98

Comparative statement of financial condition.

	Year ended—	
	June 30, 1898.	June 30, 1897.
ASSETS.		
Cost of road, fixtures, and equipment	\$171,538,543.52	\$171,541,214.37
Land contracts, land cash, etc.	558,223.95	819,032.76
Fuel, material, and stores on hand	1,107,166.80	684,439.06
Cash on hand	191,460.43	263,221.35
Stocks and bonds	306,320.00	249,067.50
Miscellaneous investments	18,681.28	18,733.93
Sinking funds in hands of trustees	13,743,952.45	12,956,600.73
Bills receivable	10,712.00	97,991.00
Accounts receivable	563,148.90	1,282,697.03
Due from other companies on account leases	437,751.05	340,827.23
United States transportation and sinking-fund accounts	16,774,562.15	15,888,744.74
Due from United States, unsettled accounts	1,068,161.67	1,068,161.67
Total	206,318,682.20	205,210,731.37
LIABILITIES.		
First-mortgage bonds	27,851,000.00	27,852,000.00
United States subsidy bonds	27,855,680.00	27,855,680.00
Interest on same paid by United States	48,923,416.98	47,954,139.78
Other funded debt	31,728,000.00	31,923,000.00
Interest on same due and unpaid	47,470.00	32,170.00
Interest on same accrued, not due	273,127.50	275,565.00
Dividends unpaid	26,575.00	32,186.00
Bills and accounts payable	271,549.03	1,251,316.42
Trustees' land-grant mortgage	1,270,570.77	1,482,733.36
Sinking funds uninvested	321,265.42	956,331.24
Company's sinking funds accrued, not due	117,500.00	.....
United States Thurman Act accrued, not due	495,146.46	.....
Renewal funds, rolling stock, and floating equipment	823,063.02	.....
Taxes assessed not due	84,500.00	.....
Capital stock	67,275,500.00	67,275,500.00
Total	207,364,364.18	206,890,601.78
Deficit	1,045,681.98	1,679,870.41

In addition to the assets shown in above statement the company owns the land granted by the United States to aid in the construction of the road, and which now remain unsold. The company states that the value of these lands can not now be closely determined or satisfactorily estimated.

The amount found due the United States for the year ended December 31, 1897, under the provisions of the Thurman Act, as ascertained by this office, is shown by the following statement:

EARNINGS.	
United States:	
Passenger	\$10,662.04
Freight	39,458.99
Mail	545,675.00
	<hr/>
	\$595,796.03
Commercial:	
Passenger (including express)	2,353,983.26
Freight	6,017,100.97
Miscellaneous	197,065.00
	<hr/>
	8,568,149.23
Gross earnings	<hr/>
	9,163,945.26

EXPENSES.

Maintenance of way and structures.....	\$877, 729. 25
Maintenance of equipment.....	960, 319. 07
Conducting transportation.....	2, 797, 187. 56
General expenses, taxes, etc.....	573, 400. 48
Total.....	\$5, 208, 636. 36
Interest on first-mortgage bonds.....	1, 567, 380. 00
Total expenditures.....	6, 776, 016. 36
Net earnings.....	2, 387, 928. 90
Twenty-five per cent of net earnings.....	596, 982. 25

DUE THE UNITED STATES.

One-half Government transportation as above.....	\$297, 898. 01
Five per cent of net earnings.....	119, 396. 45
Total to credit of bond and interest account.....	417, 294. 46
One-half Government transportation as above to credit of bond and interest account.....	297, 898. 02
Total requirement for the year.....	715, 192. 48

From the summarized statement appended, showing the annual requirement from the company under existing laws, from the date of the acts to the present time, and the amounts credited thereon by the Treasury Department, it appears that the company is in default on the two accounts to the extent of \$383,434.84. The company claims that unadjusted accounts before the Treasury Department and judgments in favor of the company which remain unpaid will more than offset this deficiency.

Bond and interest account.

Period.	Requirements.			Credits.		
	One-half transportation services on aided line.	Per cent of net earnings.	Total.	Transportation services rendered.	Cash payments on account of 5 per cent.	Total.
Six months ended Dec. 31, 1878.....	\$123, 852. 02	\$107, 258. 38	\$231, 110. 40	\$173, 083. 32	.....	\$173, 083. 32
Calendar year—						
1879.....	226, 378. 36	179, 912. 78	406, 291. 14	387, 120. 88	\$648, 271. 96	1, 035, 392. 84
1880.....	220, 943. 61	207, 445. 06	428, 388. 67	454, 153. 11	.....	454, 153. 11
1881.....	216, 334. 21	207, 787. 05	424, 121. 26	242, 903. 66	.....	242, 903. 66
1882.....	201, 877. 13	158, 584. 05	360, 461. 18	616, 283. 48	.....	616, 283. 48
1883.....	201, 620. 63	132, 306. 14	333, 926. 77	534, 969. 81	.....	534, 969. 81
1884.....	239, 112. 60	60, 626. 32	299, 738. 92	228, 537. 11	.....	228, 537. 11
1885.....	171, 470. 69	55, 547. 64	227, 018. 33	243, 540. 14	.....	243, 540. 14
1886.....	172, 347. 22	74, 808. 09	247, 155. 91	168, 468. 38	10, 011. 30	178, 479. 68
1887.....	171, 166. 94	93, 521. 48	264, 688. 42	182, 213. 40	.....	182, 213. 40
1888.....	194, 999. 97	94, 452. 22	289, 452. 19	201, 084. 26	.....	201, 034. 26
1889.....	196, 893. 38	78, 512. 38	269, 905. 76	183, 072. 28	.....	183, 072. 28
1890.....	243, 488. 69	50, 643. 05	294, 081. 74	217, 318. 94	.....	217, 318. 94
1891.....	253, 785. 25	105, 945. 76	359, 731. 01	90, 540. 52	.....	90, 540. 52
1892.....	249, 801. 78	77, 444. 77	327, 246. 55	416, 018. 32	.....	416, 018. 32
1893.....	255, 114. 02	74, 547. 14	329, 661. 16	258, 727. 62	.....	258, 727. 62
1894.....	273, 697. 07	52, 366. 75	326, 033. 82	257, 933. 86	.....	257, 933. 86
1895.....	295, 128. 92	58, 112. 19	353, 251. 11	303, 511. 68	.....	303, 511. 68
1896.....	294, 400. 26	55, 773. 32	350, 173. 58	321, 849. 41	.....	321, 849. 41
1897.....	297, 898. 01	119, 396. 45	417, 294. 46	310, 388. 15	.....	310, 388. 15
Total.....	4, 499, 740. 76	2, 039, 991. 62	6, 539, 732. 38	5, 791, 668. 33	658, 283. 26	6, 449, 951. 59
Less credits.....			6, 449, 951. 59			
Balance in favor of United States.....			89, 780. 79			

Sinking-fund account.

Period.	Requirements.			Credits.		
	One-half transportation services on aided line.	Cash payment to equal 25 per cent of net earnings (act of May 7, 1878).	Total.	Transportation services rendered.	Cash payments.	Total.
Six months ended Dec. 31, 1878.....	\$123,852.02	\$181,329.51	\$305,181.53	\$38,587.26	.....	\$38,587.26
Calendar year—						
1879.....	226,378.36	266,894.42	493,272.78	161,343.24	\$181,329.51	342,672.75
1880.....	220,943.62	387,892.99	608,836.61	297,442.84	229,076.32	526,519.16
1881.....	216,334.22	398,479.76	614,813.98	223,307.81	144,436.74	367,744.55
1882.....	201,877.13	230,581.93	432,459.06	576,833.06	79,149.91	655,982.97
1883.....	201,620.63	125,983.29	327,603.92	514,565.37	.....	514,565.37
1884.....	239,112.60	.....	239,112.60	228,313.33	.....	228,313.33
1885.....	171,470.70	.....	171,470.70	243,540.19	.....	243,540.19
1886.....	172,347.23	.....	172,347.23	168,468.38	.....	168,468.38
1887.....	171,166.94	31,752.08	202,919.02	182,213.45	.....	182,213.45
1888.....	194,999.98	.....	194,999.98	201,034.20	.....	201,034.20
1889.....	196,393.38	.....	196,393.38	183,072.15	.....	183,072.15
1890.....	243,438.70	.....	243,438.70	217,318.87	.....	217,318.87
1891.....	253,785.26	.....	253,785.26	90,540.28	.....	90,540.28
1892.....	249,801.78	.....	249,801.78	416,018.36	.....	416,018.36
1893.....	255,114.02	.....	255,114.02	258,727.54	.....	258,727.54
1894.....	273,667.08	.....	273,667.08	257,933.43	.....	257,933.43
1895.....	295,138.92	.....	295,138.92	303,510.96	.....	303,510.96
1896.....	294,400.25	.....	294,400.25	321,849.14	.....	321,849.14
1897.....	297,898.02	.....	297,898.02	310,388.43	.....	310,388.43
Total.....	4,490,740.84	1,622,913.98	6,122,654.82	5,195,008.29	633,992.48	5,829,000.77
Less credits.....	.....	.....	5,829,000.77	.....	.....	.....
Balance in favor of United States.....	.....	.....	293,654.05	.....	.....	.....

SIOUX CITY AND PACIFIC RAILROAD COMPANY.

This road is operated as a part of the Chicago and Northwestern system, that company owning all but a few shares of the common capital stock.

Under the Pacific railroad acts of 1862 and 1864, the Sioux City and Pacific Railroad Company received bonds from the United States to aid in its construction to the amount of \$1,628,320. The portion of the road which received this aid extends from Sioux City to California Junction, Iowa, thence to Fremont, Nebr., a distance under the original measurement of 101.77 miles, and the United States bonds issued to the company are secured by a second mortgage on this portion of the road. These subsidy bonds matured January 1, 1898, and default was made by the company in repayment thereof to the Government. The first-mortgage bonds of the company, amounting to \$1,628,000, which constitute a lien prior to that of the United States, also matured January 1, 1898.

The excess of interest paid by the United States on the subsidy bonds over all credits allowed amounted on June 30, 1898, to \$2,604,088.39, which, with the principal outstanding, made the balance of debt due the Government \$4,232,408.39. It will be seen from statements which follow that the amount which the company is annually required to pay amounts to hardly one-fifth of the annual interest repayment by the

United States on account of the subsidy bonds, so that the debt has rapidly increased.

The company also received from the United States a grant of land estimated at 60,000 acres. The records of the General Land Office show that to June 30, 1898, there had been patented to the company in the State of Nebraska 37,582.35 acres and in the State of Iowa 4,343.11 acres; total, 41,925.46 acres. All these lands other than that now used for railroad purposes were sold by the company prior to August 1, 1875. Sioux City, Iowa, via California Junction and Fremont, Nebr., are the land-grant termini.

The report of the company shows that there are 4.85 miles of 72-pound American steel rail, 97.70 miles of American steel rail, and 4.87 miles of 56-pound iron rail, and there are 97.50 miles of barbed-wire fencing. During the year 356.50 tons of new steel rails were laid at a cost of \$7,385.93, and 27,458 cedar and oak cross-ties were placed in the track, costing \$11,997.10.

The additions and betterments to the railway during the year amounted to \$1,377.49 and to rolling stock to \$127.11, the latter amount being expended in putting automatic couplers on freight cars. The assessed valuation of the railroad, including buildings and equipment, for taxation was \$617,570, an average per mile of \$5,749.

The following statements show the operations of the company for the fiscal year and the general balance sheet of the company on June 30, 1898:

Comparative statement of earnings and expenses.

	Year ended—		Difference.	
	June 30, 1898.	June 30, 1897.	Increase.	Decrease.
EARNINGS.				
Passenger	\$195,871.10	\$176,759.40	\$19,111.70	
Freight	252,257.34	180,543.92	71,713.42	
Mail	29,928.56	30,313.44		\$384.88
Express	9,492.40	9,034.00	458.40	
Miscellaneous	26,191.78	22,369.60	3,822.18	
Total	513,741.18	419,020.36	94,720.82	
EXPENSES.				
Maintenance of way and structures	64,543.28	63,569.11	974.17	
Maintenance of equipment	35,692.30	31,213.34	4,478.96	
Conducting transportation	213,583.00	196,902.21	16,680.79	
General expenses and taxes	32,871.86	33,033.81		161.95
Total	346,690.44	324,718.47	21,971.97	
Net earnings	167,050.74	94,301.89	72,748.85	
Miles operated	107.42	107.42		
Earnings per mile	\$4,782.55	\$3,900.77	\$881.78	
Expenses per mile	3,227.43	3,022.89	204.54	
Net earnings per mile	1,555.12	877.88	677.24	
Percentage of expenses to earnings	67.48	77.49		10.01

Revenue and expenditures for year.

REVENUE.

Earnings	\$513, 741. 18	
Profit and loss	5, 208. 70	
Total		\$518, 949. 88

EXPENDITURES.

Operating expenses	\$346, 690. 44	
Interest on first-mortgage bonds	97, 680. 00	
Interest on United States subsidy bonds	97, 699. 20	
New construction	1, 377. 49	
New equipment	127. 11	
Interest on preferred stock, 7 per cent.	11, 830. 00	
Total		555, 404. 24
Deficit		36, 454. 36

General balance sheet.

ASSETS.

Cost of road, fixtures, and equipment	\$5, 764, 127. 84	
Fuel, material, and stores on hand	37, 179. 95	
Cash on hand	86, 616. 02	
Accounts receivable	90, 355. 79	
Half Government transportation on aided road	86, 281. 03	
Cash payments by company to bond and interest account	21, 255. 99	
Due from United States, unsettled accounts	362, 223. 62	
Total		\$6, 448, 040. 24

LIABILITIES.

First-mortgage bonds	\$1, 628, 000. 00	
Interest on same due and accrued	1, 290. 00	
Interest on same accrued not due	48, 840. 00	
United States subsidy bonds	1, 628, 320. 00	
Interest on same paid by United States	2, 929, 785. 49	
Interest on preferred stock accrued not due	2, 957. 51	
Pay rolls and vouchers	49, 476. 21	
Due other companies on account of traffic	3, 690. 26	
Total	6, 292, 359. 47	
Capital stock:		
Common	1, 899, 400. 00	
Preferred	169, 000. 00	
Total stock and debt		8, 360, 759. 47
Deficit		1, 912, 719. 23

The amount found due the United States from the Sioux City and Pacific Railroad Company, under the acts of 1862 and 1864, for the year ended December 31, 1897, as ascertained by this office, is as follows:

EARNINGS.	
United States:	
Passenger.....	\$266. 12
Freight.....	2, 800. 86
Mail.....	28, 218. 72
	<hr/>
	\$31, 285. 70
Commercial:	
Passenger.....	166, 471. 59
Freight.....	215, 001. 18
Excess baggage.....	4, 378. 47
Express.....	9, 014. 62
Miscellaneous.....	19, 027. 71
	<hr/>
	413, 893. 57
Total.....	<hr/>
	445, 179. 27

EXPENSES.	
Maintenance of way and structures.....	\$79, 268. 55
Maintenance of equipment.....	32, 341. 58
Conducting transportation.....	189, 489. 79
General expenses and taxes.....	31, 468. 12
	<hr/>
	332, 568. 04
New construction and equipment.....	1, 064. 67
	<hr/>
Total.....	333, 632. 71
	<hr/>
Net earnings.....	111, 546. 56
	<hr/>
Five per cent of net earnings.....	5, 577. 33
	<hr/>

DUE THE UNITED STATES.

One-half Government transportation as above.....	15, 642. 85
Five per cent of net earnings as above.....	5, 577. 33
	<hr/>
Total.....	21, 220. 18

From the following statement, showing the amounts required to be paid each year by the Sioux City and Pacific Railroad Company to the United States, and the credits which have been annually allowed on account of transportation services, it appears that the company is in default to the Government on this account in the sum of \$124,087.41. The company claims, however, that it has accounts for services before the Treasury Department, which have not yet been acted upon, which will more than offset this deficiency.

Period.	Requirements.			Credits, transporta- tion services rendered.	Difference.	
	One-half transporta- tion serv- ices on aided line.	5 per cent of net earnings.	Total.		Debit.	Credit.
To June 30, 1878	\$35, 016. 36		\$35, 016. 36	\$75, 517. 99		\$40, 501. 63
Six months ended Dec. 31, 1878	3, 768. 93		3, 768. 93	8, 130. 57		4, 361. 64
Calendar year—						
1879	4, 790. 95	\$7, 132. 97	11, 923. 92	10, 335. 35	\$1, 588. 57	
1880	9, 475. 67	7, 904. 85	17, 380. 52	20, 440. 67		3, 060. 15
1881	10, 043. 20	5, 657. 46	15, 700. 66	21, 557. 98		5, 857. 32
1882	14, 066. 54		14, 066. 54	30, 270. 01		16, 203. 47
1883	4, 891. 37	5, 444. 79	10, 336. 16	10, 827. 22		291. 06
1884	9, 636. 84	12, 802. 85	22, 439. 69	20, 659. 77	1, 779. 92	
1885	6, 638. 12	12, 860. 99	19, 499. 11	39, 573. 06		20, 073. 95
1886	7, 730. 05	12, 509. 47	20, 239. 52	18, 144. 51	2, 095. 01	
1887	10, 140. 49	12, 449. 42	22, 589. 91	8, 069. 41	14, 520. 50	
1888	11, 900. 67	7, 083. 64	18, 984. 31	12, 678. 62	6, 305. 69	
1889	11, 772. 42	10, 290. 31	22, 062. 73	12, 271. 25	9, 791. 48	
1890	11, 538. 03	8, 280. 81	20, 818. 84	11, 216. 40	9, 602. 44	
1891	13, 576. 81	7, 436. 14	21, 012. 95	12, 429. 73	8, 583. 22	
1892	14, 407. 03		14, 407. 03	14, 509. 64		102. 61
1893	13, 544. 49	6, 642. 29	20, 186. 78	13, 851. 90	6, 334. 88	
1894	13, 793. 77	7, 862. 39	21, 656. 16	13, 686. 81	7, 969. 35	
1895	14, 030. 80	6, 027. 13	20, 057. 93	13, 568. 31	6, 489. 62	
1896	14, 653. 10	5, 338. 25	19, 991. 35	14, 978. 57	5, 012. 78	
1897	15, 642. 85	5, 577. 33	21, 220. 18	15, 507. 62	5, 712. 56	
Total	251, 058. 49	142, 301. 09	393, 359. 58	398, 025. 39	85, 786. 02	90, 451. 83

RECAPITULATION.

Bond and interest account.

Dr.	
To requirements under the acts of 1862 and 1864	\$393, 359. 58
Cr.	
By transportation services rendered	\$398, 025. 39
Less judgments Court of Claims in favor of United States:	
Paid in January, 1882	\$45, 987. 42
Paid in August, 1886	82, 765. 80
	128, 753. 22
Balance in favor of United States	124, 087. 41

CENTRAL BRANCH UNION PACIFIC RAILWAY COMPANY.

This company is the successor of the Central Branch Union Pacific Railroad Company, the properties of which were bought at foreclosure sale on May 23, 1898, by Simon Borg and Gilmer Clapp, for \$2,350,000. The suit for foreclosure was brought by the trustees under the first mortgage, the proceeds of sale, \$2,350,000, going to cover principal of first-mortgage bonds and accrued interest thereon. It will thus be observed that in this transaction the United States, holder of junior lien, received nothing by way of reimbursement for the indebtedness of this company. The amount due the United States by the Central Branch Union Pacific Railroad Company on June 30, 1898, was \$3,767,468.46.

Under the acts of 1862 and 1864 this company received bonds from the United States to aid in its construction amounting to \$1,600,000, a second lien being taken on the road from Atchison to Waterville, Kans., a distance of 100 miles. This principal, with accrued interest, makes the total indebtedness referred to above \$3,767,468.46. The company has defaulted in the payment of this indebtedness, and the date of such default was fixed by the Secretary of the Interior as January 1, 1896.

This company also received from the United States a grant of 781,944.83 acres of land. The records of the General Land Office show that to June 30, 1898, there had been patented to the company 222,355.63. The report of the company gives no statistics of the amount of land it has received or the amount now on hand. The receipts from that department during the year were \$298.65, and the expenses \$94.01. There are outstanding on account of time sales \$2,338.31. The Secretary of the Interior has suspended the issuance of patents except for lands which were actually sold to bona fide purchasers before default by this company.

The line of the road extends from Atchison to Waterville, Kans., a distance of 100 miles. There are 0.80 of a mile of double track and 25.73 miles of sidings. The entire main line is laid with American steel rails of 52 and 56 pounds weight. The cross-ties are oak and average 2,900 to the mile. There are 173 miles of barbed-wire fencing, and bridges aggregating 6,409 feet in length. The ballast consists of 25.94 miles of stone, 19.34 miles of cinder, and 54.72 miles of earth.

There were no renewals of rails during the year. Oak cross-ties, numbering 44,848, were placed on the track, at a cost of \$20,183.38. Betterments to railway and rolling stock were effected through expense accounts, but no improvement account is kept. The rolling stock consists of 35 locomotives and 23 cars in the passenger, 504 in the freight, and 192 in the miscellaneous departments, respectively. The assessed valuation of roadway, bridges, track, buildings, etc., for taxation is \$677,005, and of rolling stock and equipment \$63,000.

The following statements show the operations for the year and the company's general balance sheet on June 30, 1898:

Comparative statement of earnings and expenses.

	Year ended—		Difference.	
	June 30, 1898.	June 30, 1897.	Increase.	Decrease.
EARNINGS.				
Passenger	\$65,958.79	\$52,788.30	\$14,170.49	
Freight	563,729.31	395,943.54	167,785.77	
Mail	16,353.84	16,353.84		
Express	4,086.24	3,266.36	769.88	
Miscellaneous	46,418.24	52,779.56		\$6,361.32
Total	697,496.42	521,131.60	176,364.82	
EXPENSES.				
Maintenance of way and structures	65,801.69	60,619.38	5,182.31	
Maintenance of equipment	72,204.92	36,519.36	35,685.56	
Conducting transportation	232,310.66	156,058.33	76,252.33	
General expenses and taxes	23,063.16	20,961.98	2,121.18	
Total	393,400.43	274,159.05	119,241.38	
Net earnings	304,095.99	246,972.55	57,123.44	
Miles operated	100.00	100.00		
Earnings per mile	3,974.96	5,211.32	1,783.64	
Expenses per mile	3,934.00	2,741.59	1,192.41	
Net earnings per mile	3,040.96	2,469.73	571.23	
Percentage of expenses to earnings	56.40	52.60	3.80	

Revenues and expenditures for ten months, to April 30, 1898.

REVENUES.

Earnings	\$584, 635. 37	
Interest and income from investments	6, 151. 70	
Receipts from land department	204. 64	
Pay rolls canceled .....	.55	
Interest on bank balances	2, 866. 94	
Total		\$593, 859. 20

EXPENDITURES.

Taxes as far as reported	\$19, 866. 61	
Operating expenses	314, 988. 45	
Interest on first-mortgage bonds matured	80, 000. 00	
Interest on other funded debt	36, 750. 00	
Losses on leased lines	112, 091. 81	
Other expenditures	105. 05	
United States requirement (ten months)	19, 303. 32	
Total		583, 105. 24
Surplus		10, 753. 96

General balance sheet at closing of accounts, April 30, 1898.

ASSETS.

Cost of road, fixtures, and equipment	\$3, 998, 019. 76	
Receivers United States earnings suspense account	71, 029. 90	
Land contracts	2, 338. 35	
Half Government transportation	663, 720. 53	
Profit and loss, including interest on United States bonds	5, 676, 100. 28	
Receivers Central Branch Union Pacific Railroad Company	32, 578. 76	
Total		\$10, 443, 787. 58

LIABILITIES.

First-mortgage bonds	\$2, 230, 000. 00	
Interest on same due and accrued	631, 915. 00	
United States subsidy bonds	1, 600, 000. 00	
Interest on same paid by United States	2, 826, 608. 26	
Bills payable	2, 084, 234. 42	
Receivers Central Branch Union Pacific Railroad Company (United States earnings withheld)	71, 029. 90	
Capital stock	1, 000, 000. 00	
Total		10, 443, 787. 58

The amount found due the United States from the Central Branch, Union Pacific Railroad Company, under the acts of 1862 and 1864, for the year ended December 31, 1897, as ascertained by this office, is as follows:

EARNINGS.

United States:		
Passenger.....	\$10.86	
Freight.....	2.07	
Mail.....	16,353.84	\$16,366.77
Commercial:		
Passenger	60,620.09	
Freight.....	482,309.86	
Express	3,681.45	
Miscellaneous, including rent	49,687.64	596,299.04
Total.....		612,665.81

EXPENSES.

Maintenance of way and structures.....	\$70,781.44	
Maintenance of equipment	53,576.87	
Conducting transportation	192,432.52	
General expenses	24,368.71	
Taxes	37,671.45	
Total		378,830.99
Net earnings.....		233,834.82
Five per cent of net earnings.....		11,691.74

DUE THE UNITED STATES.

Half Government transportation, as above.....	8,183.38
Five per cent net earnings, under act of 1862.....	11,691.74
Total.....	19,875.12

From the following statement, showing the requirements each year from this company, under the acts of 1862 and 1864, and the credits applied thereto, it will be seen that the balance is in favor of the company:

Period.	Requirements.			Credits.		Difference.	
	One-half transportation services on aided line.	5 per cent of net earnings.	Total.	Transportation services rendered.	Cash payment on account of 5 per cent.	Debit.	Credit.
To June 30, 1878.....	\$31,019.43	\$2,612.97	\$33,632.40	\$67,498.35		\$67,498.35	\$33,865.95
Six months ended Dec. 31, 1878.....	1,096.42	4,313.94	5,410.36	3,947.19		3,947.19	\$1,463.17
Calendar year.....							
1879.....	2,680.95		2,680.95	1,697.19		1,697.19	983.76
1880.....	5,671.21	8,558.18	14,229.39	27,346.22	\$6,926.91	34,273.13	20,043.74
1881.....	5,635.00	8,220.72	13,855.72	34,064.15		34,064.15	20,208.43
1882.....	6,209.29	11,809.60	18,078.98	33,598.58		33,598.58	15,519.60
1883.....	6,897.36	19,303.58	26,170.94	19,767.74		19,767.74	6,403.20
1884.....	6,872.43	12,925.60	19,798.12	9,541.00		9,541.00	10,256.52
1885.....	6,941.65	12,351.83	19,293.48	67,056.06		67,056.06	47,762.58
1886.....	7,093.94	18,037.85	25,131.79	38,099.60		38,099.60	12,967.81
1887.....	7,261.92	12,835.27	20,147.19	42,736.98		42,736.98	22,589.79
1888.....	7,294.53	7,269.71	14,564.24	42,646.06		42,646.06	27,981.82
1889.....	7,217.12	7,311.53	14,528.65	42,940.05		42,940.05	28,311.40
1890.....	7,561.11	4,968.57	12,569.68	43,291.92		43,291.92	30,722.24
1891.....	7,942.26	6,799.38	14,741.62	45,049.33		45,049.33	30,307.71
1892.....	7,942.50	12,186.62	20,130.12	45,015.37		45,015.37	24,885.25
1893.....	7,938.23	7,189.96	15,119.21	44,992.17		44,992.17	29,872.96
1894.....	8,086.79		8,086.79	33,854.06		33,854.06	25,767.27
1895.....	8,188.16		8,188.16	14,268.42		14,268.42	6,080.26
1896.....	8,198.62	7,682.04	15,880.66	8,131.37		8,131.37	
1897.....	8,183.28	11,691.74	19,875.12	8,130.51		8,130.51	11,744.61
Total.....	166,150.78	176,120.24	342,280.97	673,672.92	6,926.91	680,629.83	376,906.81

RECAPITULATION.

Bond and interest account.

DR.		
To requirements under acts of 1862 and 1864	\$342,280.97	
CR		
By transportation services rendered and cash payment.....	\$680,469.32	
Less judgment Court of Claims, 1880, in favor of company, paid in cash.....	25,521.04	
		<u>654,948.28</u>
Balance in favor of company.....		312,667.31

ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY.

This company was chartered December 12, 1895, and succeeded to the property and franchises of the Atchison, Topeka and Santa Fe Railroad Company, whose property was sold under foreclosure on December 10, 1895. The new company assumed control on January 1, 1896.

By the act of Congress approved March 3, 1863, the Atchison, Topeka and Santa Fe Railroad Company received from the United States, through the State of Kansas, a grant of 3,000,000 acres of land. Atchison, Kans., and State line Kansas and Colorado—Lawrence, Kans., and south boundary of Kansas, near Coffeyville, are the land-grant termini. By the same act a grant of 800,000 acres was made to the Leavenworth, Lawrence and Galveston Railroad Company, which was acquired by this company by consolidation on April 16, 1885.

The records of the General Land Office show that to June 30, 1898, there had been patented to the Atchison, Topeka and Santa Fe Railroad Company 2,944,788.14 acres, and to the Leavenworth, Lawrence and Galveston Railroad Company 249,446.13 acres.

The granted lands were not sold under the reorganization to the new company, and a report thereon has been furnished by Messrs. Walker and McCook, receivers for the old company. They report that that company had received by United States patent 2,934,659.68 acres, of which 6,641.07 acres had been reclaimed by the United States. The company has disposed of all of its lands for cash and on time sales. The total cash receipts from all sales to June 30, 1898, amounted to \$12,100,808.24. The receipts from that department during the year amounted to \$31,741.35, and the expenses to \$3,009.17.

The report of the company on the form prescribed by this office includes the property and operations of the following-named companies, of which practically the entire issue of capital stock and bonds are owned by this company and pledged as part of the security for its general-mortgage bonds, and the property of which is operated as a part of this system, viz:

Atchison, Topeka and Santa Fe Railroad Co., in Chicago.
 Chicago, Santa Fe and California Railway Co.
 Mississippi River Railroad and Toll Bridge Co.
 The Sibley Bridge Co.
 St. Joseph, St. Louis and Santa Fe Railway Co.
 Chicago, Kansas and Western Railroad Co.

Florence, Eldorado and Walnut Valley Railroad Co.
Kansas City, Emporia and Southern Railway Co.
Kansas City, Topeka and Western Railroad Co.
Leavenworth, Northern and Southern Railway Co.
Marion and McPherson Railway Co.
Southern Kansas Railway Co.
Wichita and Southwestern Railway Co.
Denver and Santa Fe Railway Co.
Pueblo and Arkansas Valley Railroad Co.
New Mexico and Southern Pacific Railroad Co.
Rio Grande, Mexico and Pacific Railroad Co.
Silver City, Deming and Pacific Railroad Co.

It also includes the Rio Grande and El Paso Railroad and the Southern Kansas Railway of Texas, which are controlled by this company through ownership of stock and bonds, but are operated separately.

During the year an agreement was entered into between this company and the Southern Pacific Company for the exchange of the Mojave division of the Atlantic and Pacific, extending from The Needles to Mojave, Cal. (heretofore leased by that company from the Southern Pacific Company), for the Sonora Railway system of this company, extending from Benson, Ariz., to Guaymas, in the State of Sonora, Mexico.

The company operated 1,595.10 miles of main line and 2,990.72 miles of branch lines, making the total length of road 4,585.82 miles. There are 16.02 miles of double track and 936.01 miles of sidings. Steel rails are laid on 4,381.98 miles of track, and there are 2,473 miles of barbed-wire fencing. The ballast consists of 600.17 miles of stone, 482.31 miles of gravel, 46.53 miles of slag, 243.02 miles of cinder, and 3,146 miles of earth.

During the year 23,871 tons of new steel rails were laid, at a cost of \$405,818.53, and 1,314,346 new cross-ties were placed in the track, costing \$510,671.72. The additions and betterments to railway, etc., which were charged to construction account, amounted to \$2,506,320.26. The additions and betterments to rolling stock during the year, charged to equipment account, amounted to \$67,205.62. The rolling stock consists of 835 locomotives and 520 cars in the passenger, 24,877 in the freight, and 1,777 in the miscellaneous departments, respectively.

The assessed valuation of roadway, etc., for taxation was \$29,211,067, and of equipment \$6,441,328.

The following statements show the operations for the year and the company's general balance sheet on June 30, 1898:

	Year ended—		Difference	
	June 30, 1898.	June 30, 1897.	Increase.	Decrease.
EARNINGS.				
Passenger	\$4, 722, 485. 57	\$3, 958, 557. 28	\$763, 928. 29	
Freight	18, 875, 693. 58	16, 526, 656. 06	2, 349, 037. 52	
Mail	777, 173. 35	756, 196. 40	20, 976. 95	
Express	824, 136. 03	753, 456. 80	70, 679. 23	
Miscellaneous	875, 633. 29	843, 274. 23	532, 359. 06	
Total	26, 075, 121. 82	22, 338, 140. 77	3, 736, 981. 05	
EXPENSES.				
Maintenance of way and structures	4, 724, 587. 96	4, 592, 825. 10	131, 762. 86	
Maintenance of equipment	3, 016, 458. 54	2, 719, 925. 60	296, 532. 94	
Conducting transportation	9, 339, 656. 56	8, 189, 442. 63	1, 150, 213. 93	
General expenses and taxes	1, 820, 910. 91	1, 926, 287. 36		\$105, 376. 45
Total	18, 901, 613. 97	17, 428, 480. 69	1, 473, 133. 28	
Net earnings	7, 173, 507. 85	4, 909, 660. 08	2, 263, 847. 77	
Miles operated	4, 547. 39	4, 563. 85		16. 46
Earnings per mile	5, 734. 08	4, 894. 58	839. 50	
Expenses per mile	4, 156. 58	3, 818. 81	337. 77	
Net earnings per mile	1, 577. 50	1, 075. 77	501. 73	
Percentage of expenses to earnings	72. 48	78. 02		5. 54

Revenue and expenditures for year.

REVENUE.	
Earnings	\$26, 075, 121. 82
Dividends on stocks of other companies	45, 632. 00
Interest on bonds of other companies	50, 319. 75
Profits on miscellaneous investments	4, 696. 78
Interest on miscellaneous investments	63, 448. 48
Net income from separately operated roads of the system	1, 602, 390. 44
Total	\$27, 841, 609. 27
EXPENDITURES.	
Operating expenses	\$18, 901, 613. 97
Interest on general mortgage bonds	4, 436, 351. 08
Interest on other funded debt	555, 797. 22
Losses on miscellaneous investments	28, 754. 13
Miscellaneous deductions	28, 667. 93
Total	23, 951, 184. 33
Surplus	3, 890, 424. 94

General balance sheet.

ASSETS.	
Cost of road, fixtures, and equipment	\$389, 495, 885. 01
Improvements, auxiliary roads	2, 673, 957. 01
Capital stock, preferred, in trust	17, 286, 470. 00
Fuel, material, and stores on hand	1, 085, 057. 68
Cash on hand	2, 202, 891. 09
Company's stocks and bonds	2, 037, 734. 13

Other stocks and bonds	\$285, 222. 51
Sinking fund in hands of trustees.....	355, 344. 86
Bills receivable.....	141, 159. 01
Accounts receivable.....	2, 043, 778. 57
Due from agents.....	149, 687. 18
Suspense accounts.....	2, 427. 84
Total.....	\$417, 759, 614. 89

LIABILITIES.

General mortgage bonds	\$117, 067, 500. 00
Interest on same due and accrued	99, 670. 00
Interest on same accrued not due.....	1, 151, 377. 50
Other funded debt	57, 871, 210. 00
Interest on same due and unpaid	79, 710. 00
Interest on same accrued not due.....	59, 500. 00
Pay rolls and vouchers.....	2, 533, 706. 32
Due other companies on account of traffic, net.....	164, 224. 86
Accrued taxes not yet due.....	642, 944. 31
Unascertained liabilities, estimated.....	373, 663. 78
Rolling stock replacement fund.....	88, 810. 58
Rail renewal fund.....	198, 651. 98
Capital stock.....	233, 486, 000. 00
Total.....	413, 816, 969. 33
Surplus.....	3, 942, 645. 56

SANTA FE PACIFIC RAILROAD COMPANY.

The Santa Fe Pacific Railroad Company was organized by the purchasers (the Atchison, Topeka and Santa Fe Railway Company) as the successor of the Atlantic and Pacific Railroad Company on June 16, 1897, when a certificate of its organization was filed in the office of the Secretary of the Interior. The new company formally assumed possession of the property on July 1, 1897.

By an act of Congress approved July 27, 1866, the Atlantic and Pacific Railroad Company, of which this road is the successor, received from the United States a grant of 42,000,000 acres of land. Springfield, Mo., via Canadian River; Albuquerque and Agua Fria and Colorado River and the Pacific Ocean are the land-grant termini. The portion of this grant within the State of Missouri, estimated at 1,139,200 acres, is now owned by the St. Louis and San Francisco Railroad Company. The records of the General Land Office show that by the act of July 6, 1886, there were forfeited in California and New Mexico 10,795,480 acres, and that 4,790,000 acres of railroad indemnity lands have been restored to the public domain. There had been patented to the company to June 30, 1898, in Arizona 373,099.38 acres and in New Mexico 335,624.09 acres, making a total of 708,723.47 acres.

The company reports that it has received by United States patent 708,523.47 acres of land, all of which has been disposed of, the total receipts to date being \$3,945,082.04. The receipts from that source during the year amounted to \$11,191.44, and the expenses exceeded that amount by \$4,483.15.

The number of miles of road owned is 563.49, and leased 255.06; there are 130.07 miles of sidings, making the total length of road operated 948.62 miles. The road is laid with steel rails of 50 and 66 pounds to the yard. During the year 23,449 tons of new steel rails were laid, at a cost \$523,810.26, and 596,409 new cross-ties were placed in the track, costing \$272,043.26. The additions and betterments to railway amounted to \$21,384,900.76, the purchase price of the road being charged to this account; the additions to rolling stock amounted to \$12,503.44.

The equipment consists of 95 locomotives, all of which are equipped with air brakes; 30 cars in the passenger service, all equipped with Westinghouse brakes and Miller couplers and platforms; 1,825 cars in the freight service, of which 1,504 are equipped with air brakes, and 21 cars in the road and miscellaneous service.

The express business is transacted by Wells, Fargo & Co. Pullman Palace Car Company's sleeping and tourist cars are run on a mileage basis. The telegraph business is conducted under contract with the Western Union Telegraph Company.

The following statements show the earnings and expenses for the year, and the financial condition of the company on June 30, 1898:

Earnings and expenses.

EARNINGS.	
Passenger.....	\$928,519.52
Freight.....	3,601,014.97
Mail.....	134,240.30
Express.....	116,974.54
Miscellaneous.....	61,924.43
Total.....	<u>\$4,842,673.76</u>
EXPENSES.	
Maintenance of way and structures.....	\$1,469,840.16
Maintenance of equipment.....	725,788.31
Conducting transportation.....	2,064,160.08
General expenses and taxes.....	221,829.98
Total.....	<u>\$4,481,618.53</u>
Net earnings.....	361,055.23

Revenue and expenditures for year.

REVENUE.	
Earnings.....	\$4,842,673.76
Interest on bonds of other companies.....	1,575.00
Receipts of the land department.....	11,191.44
Total.....	<u>\$4,855,440.20</u>
EXPENDITURES.	
Operating expenses.....	\$4,481,618.53
Interest on funded debt.....	640,000.00
Miscellaneous deductions.....	236,199.91
Expenses of land department.....	16,674.59
Total.....	<u>\$5,374,493.03</u>
Deficit.....	519,052.83

General balance sheet.

ASSETS.	
Cost of road and fixtures	\$20,436,042.94
Cost of equipment	961,361.26
Cash on hand	118,950.28
Stocks and bonds	72,300.00
Material and fuel	470,979.37
Accounts receivable	191,976.96
Due from other companies on account traffic	193,711.30
Due from agents	4,574.76
Suspense accounts	8,026.28
Total	\$22,457,923.15
LIABILITIES.	
First-mortgage bonds	\$16,000,000.00
Interest on same due and accrued	480,000.00
Interest on same accrued not due	160,000.00
Bills payable	896,144.43
Accounts payable	19,402.72
Pay rolls and vouchers	696,017.57
Atlantic and Pacific Railroad Company, coupon account	480.00
Rolling stock replacement fund	28,025.93
Accrued taxes not yet due	39,805.33
Atchison, Topeka and Santa Fe Railway Company ..	655,100.00
Capital stock	4,000,000.00
Total	22,976,975.98
Deficit	519,052.83

CHICAGO AND NORTHWESTERN RAILWAY COMPANY.

This company was incorporated June 7, 1859, as the successor of the Chicago, St. Paul and Fond du Lac Railroad Company, and its entire main line was opened to public business on September 1, 1859. By consolidations formed at various times the lines of the following companies were acquired:

- Dixon, Rockford and Kenosha Railway.
- Galena and Chicago Union Railroad.
- Peninsular Railroad.
- Beloit and Madison Railroad.
- Baraboo Air Line Railroad.
- La Crosse, Trempealeau and Prescott Railroad.
- Menominee River Railroad.
- Escanaba and Lake Superior Railway.
- Elgin and State Line Railway.
- Chicago, Milwaukee and Northwestern Railway.

The company has also acquired by purchase the property and franchises of the following companies:

- Galesville and Mississippi River Railroad.
- Rock River Railroad.
- Chicago, Iowa and Nebraska Railroad.
- Cedar Rapids and Missouri River Railroad.
- Maple River Railroad.
- Stanwood and Tipton Railway.

Iowa Midland Railway.
 Ottumwa, Cedar Falls and St. Paul Railway.
 Iowa Southwestern Railway.
 Des Moines and Minneapolis Railroad.
 Maple Valley Railway.
 Janesville and Evansville Railway.
 Sioux Valley Railway.
 Iowa Railway Coal and Manufacturing Company.
 Linn County Railway.
 Sycamore and Cortland Railroad.
 Northern Illinois Railway.
 Lake Geneva and State Line Railway.
 Iron River Railway.
 Iron Range Railway.
 Toledo and Northwestern Railway.
 Junction Railway.
 Paint River Railway.
 Milwaukee, Lake Shore and Western Railway.

The following-named companies are controlled by the Chicago and Northwestern Railway Company by ownership of capital stock, and their operations and accounts are included in the report to this office:

Dakota Central Railway,
 Princeton and Western Railway,
 Winona and St. Paul Railroad.

The company also operates, under lease, the St. Paul and Eastern Grand Trunk Railway, owns the entire capital stock of the Fremont, Elkhorn and Missouri Valley Railroad Company, and has a controlling interest in the Sioux City and Pacific, and the Chicago, St. Paul, Minneapolis and Omaha Railway companies, but the operations of the last two companies are reported separately to this office.

The number of acres of land granted to aid in the construction of the roads forming part of the system was 7,642,821.19. Winona, Minn., and Big Sioux River, near Watertown Station; Cedar Rapids, Iowa, to transfer grounds, Union Pacific Railway; and Lyons, Iowa, to Clinton, Iowa, are the land-grant termini.

The records of the General Land Office show that to June 30, 1898, of the foregoing grants, land had been patented as follows:

	Acres.
Cedar Rapids and Missouri River.....	1,055,513.78
Chicago, St. Paul, Minneapolis and Omaha.....	2,170,946.95
St. Paul and Sioux City.....	1,123,578.55
Sioux City and St. Paul.....	407,910.21
Sioux City and Pacific.....	41,925.46
Winona and St. Peter.....	1,678,618.06
Chicago and Northwestern.....	1,064,406.35
Total.....	7,542,899.36

The records of the General Land Office also show that 125,000 acres of railroad indemnity lands located in Wisconsin belonging to the Chicago, St. Paul, Minneapolis and Omaha Railway Company had been restored, and that, on the recommendation of the Commissioner, affirmed by the Secretary of the Interior, 26,017.33 acres, located in Iowa, belonging to the Sioux City and St. Paul Railroad Company,

were also restored to the public domain on September 12, 1887, and 21,979.85 acres in Iowa on February 27, 1896. The company still owns 807,114.94 acres.

The total cash receipts from all sales to date amounted to \$9,104,891.26, and there were outstanding on account of sales \$694,497.76. The receipts from the land department during the year amounted to \$460,142.29 and the expenditures to \$161,179.62. The land sold at an average price per acre of \$9.20.

The mileage of the system June 30, 1898, was 5,085.62; miles added during the year, 54.84. The road is practically all laid with steel; 4,294.91 miles of line are fenced.

During the year 23,550.41 tons of new steel rails were laid at a cost of \$429,028.78, and 2,211,482 new cross ties were placed under the track, costing \$724,116.84. The ballast consists of 230.21 miles of stone and slag, 3,250.80 miles of gravel, 259.72 miles of cinder, and 1,336.16 miles of earth and sand. The additions and betterments to railway during the year amounted to \$2,937,444.86.

The rolling stock consists of 1,010 locomotives, 853 cars in passenger, 35,633 in the freight, and 76 in the road and miscellaneous departments, respectively, being an increase in cars over last year of 24 passenger, 650 freight, and 1 in the road and miscellaneous department.

The railway, including buildings, rolling stock, etc., is assessed in the States of Illinois, Iowa, and North and South Dakota, at \$14,920,119; in Wisconsin, Michigan, and Minnesota no assessment is made, the tax being levied as a percentage of the gross earnings.

The following statements show the operations of the company for the year, and the general balance sheet on June 30, 1898:

Comparative statement of earnings and expenses.

	Year ended—		Difference.	
	June 30, 1898.	June 30, 1897.	Increase.	Decrease.
EARNINGS.				
Passenger	\$7,396,201.79	\$6,941,627.07	\$456,574.72	
Freight	27,157,439.09	22,310,607.38	4,846,832.31	
Mail	888,201.44	877,684.98	10,616.46	
Express	567,429.95	567,767.96		\$338.01
Miscellaneous	309,012.87	331,898.96		22,886.09
Total	36,320,385.74	31,029,586.35	5,290,799.39	
EXPENSES.				
Maintenance of way and structures	4,694,684.19	4,080,202.14	805,682.05	
Maintenance of equipment	4,354,946.43	2,891,306.45	1,463,639.98	
Conducting transportation	13,012,147.80	11,049,519.83	1,962,627.97	
General expenses and taxes	1,857,356.72	1,787,760.47	69,587.25	
Total	24,119,335.14	19,817,797.89	4,301,537.25	
Net earnings	12,201,050.60	11,211,788.46	989,262.14	
Miles operated	5,085.62	5,030.78	54.84	
Earnings per mile	\$7,141.77	\$6,167.94	\$973.83	
Expenses per mile	4,742.65	3,939.31	803.34	
Net earnings per mile	2,399.12	2,228.63	170.49	
Percentage of expenses to earnings	66.40	63.86	2.54	

Revenue and expenditures.

REVENUE.	
Earnings	\$36, 320, 385. 74
Dividends on stocks of other companies	1, 022, 668. 50
Interest on miscellaneous investments	42, 302. 72
Receipts of land department	460, 142. 29
Total	\$37, 845, 499. 25
EXPENDITURES.	
Operating expenses and taxes	\$24, 119, 335. 14
Interest on funded debt	7, 018, 836. 15
Interest paid in advance of maturity on bonds surrendered in refunding	333, 210. 23
Rentals	17, 911. 43
Sinking-fund requirements, guaranteed interest ...	236, 228. 57
New construction	2, 937, 446. 86
New equipment	298, 714. 68
Dividends 94, 95, 96, 97 preferred, and 47, 48 common.	3, 519, 823. 75
Expenses of the land department	161, 179. 62
Total	38, 642, 686. 43
Deficit	797, 187. 18

General balance sheet.

ASSETS.	
Cost of road, fixtures, and equipment	\$178, 316, 351. 34
Real estate other than road	65, 000. 00
Land-grant investment	23, 925. 00
Fuel, material, and stores on hand	1, 793, 232. 24
Cash on hand	4, 856, 795. 18
Company's stocks and bonds owned by company..	2, 525, 482. 61
Other stocks and bonds, including bonds held by trustee as collateral for bonds of Chicago and Northwestern Railway Company issue	25, 319, 879. 00
Sinking fund with trustees—payments and accretions thereto	8, 602, 707. 04
Bills receivable	115, 203. 50
Accounts receivable	2, 180, 564. 76
Total	\$223, 799, 140. 67
LIABILITIES.	
Funded debt	\$134, 132, 000. 00
Interest on same due and unpaid	297, 253. 02
Interest on same accrued, not due	1, 609, 676. 78
Dividends unpaid	9, 223. 75
Dividends declared payable July, 1898	1, 368, 532. 50
Accounts payable	30, 540. 00
Pay rolls and vouchers	2, 522, 541. 56
Due other companies, account traffic	38, 785. 14
Due other companies, account lease	6, 000. 00
Sinking fund, installments paid	7, 117, 698. 70
Sinking fund, accretions thereto	1, 485, 008. 34
Capital stock	66, 408, 820. 53
Total	215, 026, 080. 32
Surplus	8, 773, 060. 35

CHICAGO, BURLINGTON AND QUINCY RAILROAD COMPANY.

This company was incorporated by charter act passed February 14, 1855, and its entire main line was opened to public business on January 1, 1880. The former name of the company was Aurora Branch Railroad Company, afterwards changed to Chicago and Aurora Railroad Company. The following companies have been acquired at various times by consolidations, viz: Central Military Tract Railroad, Peoria and Oquawka Railroad (afterwards Peoria and Burlington Railroad), Northern Cross Railroad (afterwards Quincy and Chicago Railroad), Burlington and Missouri River Railroad, Burlington and Missouri Railroad, Burlington and Missouri River Railroad in Nebraska, and Republican Valley Railroad.

By act of Congress approved May 15, 1856, there were granted by the United States to the State of Iowa, to aid in the construction of this road between Burlington and the Missouri River at East Platts-mouth, Iowa, 948,643.66 acres of land, and by the act of July 2, 1864, to the Burlington and Missouri River Railroad in Nebraska, to aid in construction from Platts-mouth to Kearney Junction, Nebr., 2,441,600 acres; total, 3,390,243.66 acres of land.

The records of the General Land Office show that to June 30, 1898, there had been patented to the Burlington and Missouri River Railroad Company, in Iowa, 389,989.71 acres, and in Nebraska, 2,374,090.77 acres; a total of 2,764,080.48 acres patented. The company reports that it has received by United States patent 2,373,870.77 acres of land. There have been disposed of, for cash and on time sales (including lands reclaimed by the United States), 2,325,481.18 acres, leaving 47,609.59 acres still owned by the company. The total cash receipts from all sales to June 30, 1898, amounted to \$11,263,237.97, and there were outstanding on account of time sales, principal and interest, \$239,464.56. The receipts from the land department during the year amounted to \$88,894.40, and the expenses to \$14,912.88. The remaining lands are held at an average price of \$4 per acre.

The company owns and operates 5,654.33 miles of track, leases 46.36 miles, and has trackage rights over 159.01 miles, making the total length operated 5,859.70 miles. There are 295.71 miles of second track, 23.55 miles of third track, and 1,197.45 miles of sidings.

New steel rails were laid during the year amounting to 23,865 tons, and there were placed under the track 605,288 cedar and 967,662 oak cross-ties, costing from 32 to 50 cents each. The betterments to railway, etc., during the year, which were charged to equipment account, amounted to \$865,365.29.

The rolling-stock equipment on June 30, 1898, consisted of 891 locomotives and 749 cars in the passenger service, 32.028 in the freight service, and 88 road and miscellaneous cars.

The following statements show the operations of the company for the year and its general balance sheet on June 30, 1898:

Comparative statement of earnings and expenses.

	Year ended—		Difference.	
	June 30, 1898.	June 30, 1897.	Increase.	Decrease.
EARNINGS				
Passenger	\$8,002,832.59	\$5,298,497.83	\$716,234.76	
Freight	23,536,891.09	18,224,387.07	5,312,504.02	
Mail	1,358,191.67	1,357,383.79	807.88	
Express	742,799.96	742,799.96		
Miscellaneous	912,496.84	1,022,672.27		\$110,175.43
Total	32,553,212.15	26,683,740.92	5,919,471.23	
Operating expenses and taxes	20,945,884.23	16,811,486.19	4,134,398.04	
Net earnings	11,607,327.92	9,822,254.73	1,785,073.19	
Miles operated	5,859.70	5,859.70		
Earnings per mile	\$5,555.44	\$4,545.24	\$1,010.20	
Expenses per mile	3,574.56	2,869.00	705.56	
Net earnings per mile	1,980.88	1,676.24	304.64	
Percentage of expenses to earnings	64.34	63.12	1.22	

Revenue and expenditures.

REVENUE.

Earnings	\$32,553,212.15
Dividends on stocks	1,071,348.33
Interest on bonds	990,391.27
Interest on investments	261,062.64
Receipts of land department	88,894.40
Total	\$34,904,906.79

EXPENDITURES.

Operating expenses and taxes	\$20,945,884.23
Interest on bonds	6,729,997.00
Rents	219,922.46
Other deductions from income	1,778,612.25
Dividends	3,690,126.00
Expenses of land department	14,912.88
Total	33,379,454.82
Surplus	1,525,453.97

General balance sheet.

ASSETS.

Cost of road, fixtures, and equipment	\$206,634,183.10
Cost of other real estate	40,680.24
Material on hand	1,513,508.44
Cash and current assets	8,877,377.58
Stocks and bonds owned by company	37,895,041.47
Miscellaneous investments	3,500,788.64
Sinking fund	11,434,679.89
Total	\$269,896,259.36

LIABILITIES.

Bonds	\$128, 735, 900. 00	
Interest on same, accrued (deduction)	4, 124. 00	
Sinking fund	18, 133, 975. 52	
Renewal fund	10, 000, 000. 00	
Current accounts (balance)	730, 352. 82	
Income account	12, 256, 360. 17	
Bills payable	4, 574, 343. 02	
Capital stock	82, 004, 200. 00	
Total	256, 431, 007. 53	
Surplus	13, 465, 251. 83	

CHICAGO, MILWAUKEE AND ST. PAUL RAILWAY COMPANY.

This company has not submitted a report of its operations on form prescribed by this office.

The company was originally organized May 5, 1863, as the Milwaukee and St. Paul Railway Company, and on February 14, 1874, its name was changed, under legislative authority, to Chicago, Milwaukee and St. Paul Railway Company. The company has acquired by purchase at various times, among others, the following railroads, viz: McGregor and Missouri River Railroad, Minnesota Central Railroad, Hastings and Dakota Railroad, and the Southern Minnesota Railroad.

By acts of Congress approved March 3, 1857, May 12, 1864, and July 4, 1866, lands were granted by the United States through the States of Iowa and Minnesota to aid in the construction of the following roads forming a part of the present system:

	Acres.
McGregor and Missouri River	1, 536, 000. 00
Minnesota Central	643, 403. 00
Hastings and Dakota	550, 000. 00
Southern Minnesota	794, 619. 45
Total	3, 524, 022. 45

The records of the General Land Office show that to June 30, 1898, there had been patented to the—

	Acres.
Chicago, Milwaukee and St. Paul }	325, 126. 29
McGregor and Missouri River.... }	
Minnesota Central	179, 734. 29
Hastings and Dakota	364, 628. 01
Southern Minnesota	546, 284. 69
Total	1, 415, 773. 28

St. Paul, via Mendota or St. Paul Junction, Faribault, Austin and Lyle, Minn.; Minneapolis, via same route and Lyle, Minn.; Calmar and Sheldon, Iowa; Junction with Chicago, St. Paul, Minneapolis and St. Paul and Sioux City Division; Hastings, Minn., and Ortonville, at western boundary of State; Mississippi River (La Crescent) opposite La Crosse, Wis., and Houston, Minn., and Airlie on western boundary of Minnesota, are the land-grant termini.

The company's report to its stockholders for the year ended June 30, 1898, a copy of which has been furnished this office, gives no information concerning its lands. The following statistics have been compiled from the above report. The company owns solely 7,813.53 miles; owns jointly with other companies 62.90 miles, and uses under contract 62.12 miles, making the total operated 7,938.55 miles, including sidings, second and third tracks. New steel rails to the amount of 42,260 tons were laid during the year, and 1,670,503 cross-ties were placed in the track.

The equipment in service on June 30, 1898, consisted of 808 locomotives, 775 cars in passenger service, 29,400 in the freight and 550 in the road and miscellaneous service. The company also owns the following narrow-gauge equipment: Seven locomotives, 9 passenger cars, 309 freight and 5 caboose cars.

The operations for the year and the company's balance sheet on June 30, 1898, are shown by the following statements:

Comparative statement of earnings and expenses.

	Year ended—		Difference.	
	June 30, 1898.	June 30, 1897.	Increase.	Decrease.
EARNINGS.				
Passenger	\$5,998,840.18	\$5,717,495.98	\$289,344.20	
Freight	25,488,851.72	22,104,802.66	3,384,049.06	
Mail and express	2,733,971.78	2,664,469.35	69,502.43	
Total	84,189,663.68	30,486,767.99	3,702,895.69	
EXPENSES.				
Maintenance of way and structures	4,642,275.15	4,334,954.78	307,320.37	
Maintenance of equipment	2,918,523.70	2,464,838.52	453,685.18	
Conducting transportation	9,390,370.07	8,475,313.40	915,056.67	
General expenses and taxes	4,250,397.69	3,302,432.38	947,965.31	
Total	21,201,566.61	18,577,539.08	2,624,027.53	
Net earnings	12,988,097.07	11,909,228.91	1,078,868.16	
Miles operated	6,153.83	6,152.55	1.28	
Earnings per mile	\$5,555.83	\$4,955.14	\$600.69	
Expenses per mile	3,445.26	3,019.48	425.78	
Net earnings per mile	2,110.57	1,935.66	174.91	
Percentage of expenses to earnings	62.01	60.93	1.08	

Revenue and expenditures.

REVENUE.

Earnings	\$34,189,663.68
Income from other sources	131,018.12
Total	\$34,320,681.80

EXPENDITURES.

Operating expenses, including taxes	\$21,201,566.61
Interest accrued on funded debt	7,190,431.46
Dividends payable April 19, 1898	2,237,989.00
Total	30,629,987.07
Surplus	3,690,694.73

General balance sheet.

ASSETS.

Cost of road and equipment.....	\$214, 195, 294. 69
Bonds, stock, etc., of other companies.....	840, 523. 12
Cash and bonds held in sinking funds.....	589, 786. 37
Farmers' Loan and Trust Company, trustees.....	409. 08
Depositories of renewal fund:	
United States Trust Company....	\$1, 083, 250. 62
Union Trust Company.....	528, 100. 00
Continental National Bank.....	50, 000. 00
	<hr/>
	1, 661, 350. 62
Insurance department.....	10, 000. 00
Material and fuel.....	2, 265, 902. 03
Bonds purchased for sinking fund.....	319, 247. 50
Mortgage bonds of company unsold, held in treasury, and due from trustees.....	5, 498, 000. 00
Milwaukee and Northern Railroad Company bonds..	1, 089, 000. 00
Stock of the company in treasury.....	4, 700. 00
Due from agents and conductors.....	415, 847. 17
Due from sundry companies.....	108, 429. 05
Operating balances.....	147, 146. 28
Miscellaneous balances.....	979, 229. 95
Due from United States Government.....	307, 516. 20
Cash on deposit and on hand.....	5, 087, 742. 03
	<hr/>
Total.....	\$233, 520, 124. 89

LIABILITIES.

Capital stock, preferred.....	\$31, 818, 400. 00
Capital stock, common.....	46, 026, 600. 00
Funded debt.....	136, 588, 500. 00
Wisconsin Valley Division sinking fund.....	593. 87
Dubuque Division sinking fund.....	589, 192. 50
Sinking fund, Illinois Central bonds.....	12, 790. 00
Renewal fund.....	1, 698, 505. 45
Replacement fund, locomotives.....	188, 400. 00
Replacement fund, cars.....	68, 292. 00
Pay rolls and vouchers.....	1, 992, 680. 11
Due sundry companies.....	248, 625. 91
Operating balances.....	3, 604. 11
Miscellaneous balances.....	1, 010, 931. 45
Dividends unclaimed.....	47, 676. 58
Interest coupons not presented.....	44, 657. 00
Interest accrued not yet due.....	3, 377, 980. 83
	<hr/>
Total.....	223, 717, 429. 81
Surplus.....	9, 802, 695. 08

CHICAGO, ROCK ISLAND AND PACIFIC RAILWAY COMPANY.

This company has failed to submit a report of its operations in the form required by this Bureau for the year ended June 30, 1898.

By act of Congress approved May 15, 1856, there were granted by the United States, through the State of Iowa, to the Mississippi and Missouri Railroad Company, afterwards consolidated with the Chicago,

Rock Island and Pacific, 1,261,181.60 acres of land. Davenport, Iowa, and the transfer grounds, Union Pacific Railway, are the land-grant termini. The records of the General Land Office show that to June 30, 1898, there had been patented to the company by the Government 608,821.68 acres of land.

This company has furnished this office with a copy of the report of its directors to the stockholders for the year ended March 31, 1898, from which the information and statements given herewith were obtained.

The sales of land during the company's fiscal year, to which title is perfect, amounted to 288.61 acres, for a consideration of \$4,620.80. Quit claims were made for 394.50 acres, for which \$46.25 were received, and rent and interest were collected amounting to \$2,358.82. The bills receivable at the end of the year amounted to \$20,170.17. The lands unsold, to which title is undisputed (not including town lots), were 911.80 acres. Taxes paid on lands unsold January 1 were \$415.91.

The company owns 2,877.40 miles, leases 352.70 miles, and has track-age rights over 338.05 miles, making the total mileage over which trains are operated 3,568.15 miles. During the year additional second track and 15.95 miles of siding were constructed. Bridges aggregating 2.62 miles were replaced by permanent structures or filled with earth, and a grain elevator was built at Straight Creek, Kansas. Work in continuing the elevation of the tracks in Chicago, in compliance with a city ordinance, cost this company \$187,797.97.

The equipment was improved by the addition of 10 locomotives and 511 box, freight, and coal cars to take the place of old and worn-out rolling stock.

The following statements show the operations for the year, and the company's financial condition on March 31, 1898:

Comparative statement of earnings and expenses.

	Year ended—		Difference.	
	Mar. 31, 1898.	Mar. 31, 1897.	Increase.	Decrease.
EARNINGS.				
Passenger	\$4, 816, 817. 18	\$4, 072, 126. 64	\$244, 690. 54	.....
Freight	13, 835, 995. 00	11, 229, 175. 33	2, 606, 819. 76	.....
Mail	567, 225. 72	562, 512. 28	4, 713. 44	.....
Express	409, 200. 00	409, 200. 00	.....	.....
Miscellaneous	419, 345. 60	873, 638. 46	.....	\$454, 292. 86
Total	19, 548, 583. 50	17, 146, 632. 71	2, 401, 950. 89	.....
Operating expenses and taxes	12, 595, 965. 95	11, 612, 827. 25	983, 138. 70	.....
Net earnings	6, 952, 617. 54	5, 533, 825. 46	1, 418, 792. 18	.....
Miles operated	3, 568. 15	3, 571. 41	.....	3. 26
Earnings per mile	\$5, 478. 64	\$4, 801. 08	\$677. 56	.....
Expenses per mile	8, 530. 11	3, 251. 61	278. 50	.....
Net earnings per mile	1, 948. 53	1, 549. 47	399. 06	.....
Percentage of expenses to earnings	64. 43	67. 78	.....	3. 30

Revenue and expenditures.

REVENUE.

Earnings	\$19,548,583.59	
Receipts from land department.....	9,000.00	
Income from loans and investments.....	470,785.03	
Total		\$20,028,368.62

EXPENDITURES.

Operating expenses and taxes	\$12,595,965.95	
Interest on bonded debt.....	3,320,450.00	
Rentals	671,565.49	
Rentals and tolls, Missouri River bridge	117,996.73	
Dividends on capital stock, 3 per cent.....	1,384,674.00	
Premium on \$1,000, 5 per cent extension and collateral bonds	537.28	
Total		18,091,189.45
Surplus.....		1,937,179.17

General balance sheet.

ASSETS.

Cost of road and equipment.....	\$103,967,158.64	
Cost of track elevation in Chicago	789,654.49	
Cost of railroad bridge at Rock Island	964,128.96	
Capital stock and bonds of connecting roads.....	6,212,292.87	
Loans and other investments.....	559,857.55	
Advances made to Chicago, Rock Island and Texas Railway Company	1,956,961.43	
Chicago, Rock Island and Pacific Railway Company's capital stock on hand	12,100.00	
Company's 6 per cent mortgage bonds on hand.....	400,000.00	
Sinking fund account	328,000.00	
Material, fuel, etc., on hand.....	690,330.92	
Due from Post-Office Department.....	142,529.18	
Accounts receivable.....	999,528.43	
Cash and cash assets.....	5,850,489.88	
Total		\$122,873,032.35

LIABILITIES.

Capital stock and fractional scrip	\$46,156,000.00	
Six per cent mortgage bonds	12,500,000.00	
Five per cent extension bonds.....	40,712,000.00	
Five per cent debenture bonds	4,500,000.00	
Chicago and Southwestern Railway bonds, guaranteed	5,000,000.00	
Addition and improvement account	8,213,000.00	
Accounts payable	1,251,741.80	
Total		118,332,741.80
Surplus.....		4,540,290.55

CHICAGO, ST. PAUL, MINNEAPOLIS AND OMAHA RAILWAY COMPANY.

This company was formed on May 25, 1880, by the consolidation of the Chicago, St. Paul and Minneapolis and the North Wisconsin Railway companies. The company is now controlled by the Chicago and Northwestern Railway Company, which owns a majority of the capital stock.

The company received, through grants of land to companies now belonging to it, 2,173,706.43 acres. Hudson and Superior, Wis., and branch, Superior and Bayfield, Wis., are the land grant termini. The records of the General Land Office show that land had been patented to June 30, 1898, as follows:

	Acres.
St. Croix and Lake Superior.....	1,357,240.24
La Crosse and Milwaukee.....	813,706.71

and also show that 125,000 acres of railroad indemnity lands belonging to the Chicago, St. Paul, Minneapolis and Omaha Railway Company, located in Wisconsin, have been restored to the public domain.

The company reports that there had been acquired by patent from the Government to date 2,163,082.79 acres, of which there had been disposed of for cash and on time contracts 1,772,426.61, leaving the number of acres still owned by the company 390,656.18. The total cash receipts from all sales to date amounted to \$8,065,184.38, and there were outstanding on account of time contracts \$87,207.57. The cash receipts from the land department during the year amounted to \$63,068.74 and the expenses to \$31,949.71, the average price per acre during the year being \$2.58, and the average price now asked \$2.50.

The company owns 1,422.64 miles of road and leases 69.59 miles, making a total of 1,492.23 miles operated. There are 23.79 miles of double track and 430.71 miles of siding, of which 12.39 were built during the past year. Steel rails are laid on 1,376.50 miles of track and iron on 115.73. The ballast consists of stone, 47.82 miles; gravel, 992.17; cinder, 113.37, and earth, 484.98 miles. There are 2,076 miles of barbed wire and 279 miles of other fencing. During the year there were laid 6,576.60 tons of new steel rails, costing \$135,745.15, and 462,593 new cross-ties were placed under the track at a cost of \$162,881.76.

The equipment at the end of the year consisted of 269 locomotives and 204 cars in the passenger service, 8,902 in the freight service, and 61 road and miscellaneous cars.

The additions and betterments to roadway, etc., amounted to \$235,708.21, charged to construction account.

The following statements show the results of the company's operations for the year and its general balance sheet for June 30, 1898:

Comparative statement of earnings and expenses.

	Year ended—		Difference.	
	June 30, 1898.	June 30, 1897.	Increase.	Decrease.
EARNINGS.				
Passenger	\$1,786,682.60	\$1,626,967.94	\$159,714.75	
Freight	6,712,595.80	5,995,913.15	716,682.15	
Mail	218,619.27	214,214.85		\$505.08
Express	158,801.76	158,006.76	295.00	
Miscellaneous	126,664.79	104,698.31	21,966.48	
Total	8,997,863.81	8,099,800.51	898,063.80	
EXPENSES.				
Maintenance of way and structures	1,411,535.09	1,123,257.53	288,277.56	
Maintenance of equipment	1,280,276.59	676,696.98	603,580.61	
Conducting transportation	2,805,218.13	2,840,086.74		34,868.61
General expenses and taxes	533,898.78	526,756.64	7,143.14	
Total	6,030,928.59	5,166,796.89	864,132.70	
Net earnings	2,966,935.22	2,933,004.62	33,930.60	
Miles operated	1,492.23	1,492.23		
Earnings per mile	\$6,029.81	\$5,427.98	\$601.83	
Expenses per mile	4,041.54	3,462.46	\$579.08	
Net earnings per mile	1,988.27	1,965.52	22.75	
Percentage of expenses to earnings	67.02	63.80	3.22	

Revenue and expenditures for year.

REVENUE.

Earnings	\$8,997,863.81
Dividends on stock of other companies	2,625.00
Interest on bonds of other companies	5,600.00
Interest on miscellaneous investments	6,842.35
Receipts of the land department	63,068.74
Total	\$9,075,999.90

EXPENDITURES.

Operating expenses and taxes	\$6,030,928.59
Interest on first-mortgage bonds	1,448,816.00
New construction	235,708.21
Dividends, common, No. 2; preferred, Nos. 44 and 45 ..	1,158,970.00
Expenses of the land department	31,949.71
Total	8,906,452.51
Surplus	169,547.39

General balance sheet.

ASSETS.

Cost of road, fixtures, and equipment.....	\$56,452,355.66
Fuel, material, and stores on hand.....	420,899.23
Cash on hand.....	1,663,971.82
Company's stocks and bonds owned by company.....	4,824,028.32
Other stocks and bonds.....	1,746,450.00
Bills receivable.....	129.16
Accounts receivable.....	777,234.74
Due from United States Post-Office Department, unsettled accounts.....	53,640.77
Total.....	\$65,938,709.70

LIABILITIES.

First-mortgage bonds.....	\$26,235,800.00
Interest on same due and accrued, including coupon due July 1, 1898.....	85,816.25
Interest on same accrued not due.....	190,788.34
Dividends unpaid.....	396,469.00
Pay rolls and vouchers.....	498,975.82
Due other companies account traffic.....	177,923.83
Due other companies account leases.....	9,800.91
Accrued taxes not yet due.....	222,749.05
Equipment funds.....	195,378.42
Capital stock.....	34,050,126.62
Total.....	62,063,828.24
Surplus.....	3,874,881.46

DUBUQUE AND SIOUX CITY RAILROAD COMPANY.

This company was organized in 1860 as the successor of the Dubuque and Pacific Railroad Company. By consolidation in 1888 the property of the Iowa Falls and Sioux City Railroad Company was acquired.

A controlling interest in the company is owned by the Illinois Central Railroad Company, and the road is now operated by that company under lease from January 1, 1895, to August 1, 1951.

By act of July 15, 1856, there were granted to the Dubuque and Pacific Railroad Company, through the State of Iowa, 1,226,163 acres of land. Dubuque, Iowa, and Sioux City, Iowa, are the land-grant termini. The records of the General Land Office show that to June 30, 1898, there had been patented to this company 605,488.58 acres, and to the Iowa Falls and Sioux City Railroad Company 683,023.80 acres.

The operating company furnishes a report of the main line from Dubuque to Sioux City, Iowa, that being the portion of the road which received a land grant. This report gives no details concerning the land department, for the reason that the lands had all been disposed of before the present operating company got possession of the railroad or the records, and there is no means of information as to the past transactions of the company's land department. The bills outstanding on

account of time sales amounted on July 1, 1898, to \$1,410, and the interest received on them during the year was \$216.

The report gives no details as to the mileage or characteristics of the road. The additions and betterments to railway amounted to \$23,474.82. The rolling stock owned by the company consists of 55 locomotives, 45 cars in the passenger and 206 in the freight departments, respectively, there having been no additions during the year.

The following statements show the operations for the year and the balance sheet on June 30, 1898:

Comparative statement of earnings and expenses.

	Year ended—		Difference.	
	June 30, 1898.	June 30, 1897.	Increase.	Decrease.
EARNINGS.				
Passenger	\$484,977.40	\$480,797.37	\$34,180.03	
Freight	1,580,420.75	1,485,398.00	95,022.75	
Mail	71,580.80	67,481.35	4,099.45	
Express	47,025.00	47,100.00		\$75.00
Miscellaneous	46,347.29	43,830.60	1,516.69	
Total	2,249,361.24	2,114,617.32	134,743.92	
EXPENSES.				
Maintenance of way and structures	202,899.21	251,306.83		48,407.62
Maintenance of equipment	192,711.15	220,545.65		27,834.50
Conducting transportation	642,671.38	648,922.76		6,251.38
General expenses and taxes	130,611.31	129,930.09	681.22	
Total	1,168,893.05	1,250,705.33		81,812.28
Net earnings	1,080,468.19	863,911.99	216,556.20	
Miles operated	326.58	326.58		
Earnings per mile	\$3,887.62	\$3,475.03	\$412.59	
Expenses per mile	3,579.19	3,829.70		250.51
Net earnings per mile	3,308.43	2,645.33	633.10	
Percentage of expenses to earnings	51.96	59.14		7.18

Revenue and expenditures for year.

REVENUE.

Earnings	\$2,249,361.24
Interest on bonds	32,235.00
Interest on land notes	216.00
Total	\$2,281,812.24

EXPENDITURES.

Operating expenses	\$1,168,893.05
Interest on first-mortgage bonds	413,000.00
Sinking fund	46,733.60
New construction	10,938.63
Dividends	299,988.00
Loss on branch lines	279,051.59
Total	2,218,604.87
Surplus	63,207.37

General balance sheet.

ASSETS.	
Cost of road and fixtures	\$21, 240, 872. 54
Land contracts	4, 410. 00
Company stocks and bonds owned by company.....	523, 073. 13
Other stocks and bonds	5. 80
Bills receivable	243. 82
Accounts receivable	652, 007. 35
Total	\$22, 420, 612. 64
LIABILITIES.	
First mortgage bonds	\$12, 155, 000. 00
Interest due and accrued	3, 360. 00
Interest accrued not due	90, 416. 67
Dividends not paid	1, 572. 05
Pay rolls and vouchers	713. 49
Capital stock	9, 999, 600. 00
Total.....	22, 250, 662. 21
Surplus.....	169, 950. 43

HANNIBAL AND ST. JOSEPH RAILROAD COMPANY.

This company was incorporated on February 16, 1847, and its main line was opened to public business February 15, 1859. It was consolidated March 1, 1867, with the Quincy and Palmyra Railroad Company, and on February 14, 1870, with the Kansas City and Cameron Railroad Company. Practically all of the common and preferred stock of this company is owned by the Chicago, Burlington and Quincy Railroad Company, and the road is now operated as a part of that system.

By act of Congress approved June 10, 1852, the company received through the State of Missouri a grant of 781,944.83 acres of land, Hannibal and St. Joseph, Mo., being the land-grant termini. The records of the General Land Office show that to June 30, 1898, there had been patented to the company 611,323.35 acres. The company reports that it has acquired by patent from the United States 603,186.34 acres, and that it has disposed of for cash and on time contracts 601,544.10 acres, leaving the balance still owned by the company 1,642.24 acres. The cash receipts from all sales during the year amounted to \$3,998.87 and the expenses to \$1,150.44. There are now outstanding on account of time sales, principal, and interest, \$2,046.46. The average price now asked for land is \$3.05 per acre.

The main line of road extends from Hannibal to St. Joseph, Mo., 206.52 miles, in addition to which the company owns 82.70 miles of branch lines, and has trackage rights over 8.10 miles, making the total length of road operated 297.32 miles. There are 93.14 miles of sidings. Steel rails are laid on 355.56 miles, and there are 538.95 miles of fencing. During the year 2,078.74 tons of new steel rails were laid, at a cost of \$39,893.78, and 88,841 new oak cross-ties were placed in the track, costing \$32,693.49.

The operations for the year and the company's balance sheet on June 30, 1898, are shown in the following statements:

Comparative statement of earnings and expenses.

	Year ended—		Difference.	
	June 30, 1898.	June 30, 1897.	Increase.	Decrease.
EARNINGS.				
Passenger	\$637,856.28	\$684,538.64	\$53,317.64	.....
Freight	1,914,312.33	1,456,055.28	458,257.05	.....
Mail	84,530.01	84,505.86	.....	\$35.85
Express	58,800.00	58,800.00	.....	.....
Miscellaneous	253,600.43	303,089.38	.....	49,428.95
Total	2,949,159.05	2,487,049.16	462,109.89	.....
Operating expenses	1,978,018.88	1,566,406.16	421,612.22	.....
Net earnings	971,140.67	930,643.00	40,497.67	.....
Miles operated	297.32	297.32	.....	.....
Earnings per mile	\$9,919.14	\$8,364.89	\$1,554.25	.....
Expenses per mile	6,662.82	5,234.78	1,418.04	.....
Net earnings per mile	3,266.32	3,130.11	136.21	.....
Percentage of expenses to earnings	66.73	62.58	4.15	.....

Revenue and expenditures for year.

REVENUE.	
Earnings	\$2,949,159.05
Interest, bank balances	8,290.86
Receipts of the land department	3,998.87
Total	\$2,961,448.78
EXPENDITURES.	
Operating expenses	\$1,978,018.88
Interest on first-mortgage bonds	480,000.00
Interest on other funded debt	3,000.00
Interest on other debt	503.48
Taxes	38,780.48
Rentals	12,013.15
Dividends, No. 7 common, No. 18 preferred	442,912.65
Expenses of the land department	1,150.44
Total	2,956,378.58
Surplus	5,070.20

General balance sheet.

ASSETS.	
Cost of road and fixtures	\$20,286,623.38
Cost of equipment	3,487,087.24
Fuel, material, and stores on hand	224,700.87
Cash on hand	72,478.38
Other cash assets	23,243.85
Other stocks and bonds	84,806.00
Miscellaneous investments	500.00
Bills receivable	78,481.25
Accounts receivable	497,532.11
Total	\$24,755,452.08

LIABILITIES.

First-mortgage bonds	\$8,000,000.00	
Other funded debt	90,000.00	
Dividends unpaid	1,181.15	
Accounts payable	4,170.00	
Pay rolls and vouchers	345,422.81	
Due other companies	274,484.74	
Due other companies on account leases	3,000.00	
Accounts not liabilities	84,679.24	
Income account	1,499,983.62	
Capital stock	14,251,969.00	
Total		24,554,890.56
Surplus		200,561.53

LITTLE ROCK AND MEMPHIS RAILROAD COMPANY.

This road was incorporated September 1, 1887, as the successor of the Memphis and Little Rock Railroad Company. Having made default in the payment of interest on its bonds, Mr. Rudolph Fink was appointed receiver on June 1, 1893. The road was ordered sold under foreclosure proceedings, to take place December 15, 1897. Sale postponed to October 25, 1898.

By the acts of Congress approved February 9, 1853, and July 28, 1866, there were granted to the Memphis and Little Rock Railroad Company, through the State of Arkansas, 438,646 acres of land. The Mississippi River, opposite Memphis, and Argenta, opposite Little Rock, are the land-grant termini. The records of the General Land Office show that to June 30, 1898, there had been patented to the company 184,657.38 acres of land. The receipts from the land department during the year amounted to \$1,739.52, and the expenses to \$2,451.69, and there are outstanding on account of time sales \$5,281.28. There were sold during the year 811.13 acres of land, and the company still owns 54,446.77 acres.

The main line of the road extends from Hopefield to Little Rock, Ark., a distance of 131.828 miles, and there are 15.1068 miles of siding; total length of track, 146.1896 miles. The track is laid with steel rails for 106.551 miles, and for 25.277 with iron rails. During the year 996.9 tons of new steel rails were laid, at a cost of \$19,393.92, and 51,359 new oak ties were placed under the track, at a cost of \$9,924.90.

The rolling-stock equipment at the end of the year consisted of 16 locomotives, 17 cars in the passenger service, 256 in the freight, and 59 in the road-repair department, respectively.

The assessed valuation of the roadway, bridges, buildings, etc., was \$619,870, and of the rolling stock and equipment \$99,149.

The following is a statement showing the operations of the company for the year and the general balance sheet on June 30, 1898:

Comparative statement of earnings and expenses.

	Year ended—		Difference.	
	June 30, 1898.	June 30, 1897.	Increase.	Decrease.
EARNINGS.				
Passenger	\$82,327.12	\$76,774.07	\$5,553.05	
Freight	361,801.05	277,107.25	84,693.80	
Mail	17,321.96	16,517.08	804.88	
Express	5,660.44	5,969.05		\$308.61
Miscellaneous	825.75	692.00	133.75	
Total	467,976.32	377,089.45	90,886.87	
EXPENSES.				
Maintenance of way and structures	114,907.54	114,272.01	635.53	
Maintenance of equipment	49,837.45	41,967.19	7,870.26	
Conducting transportation	171,436.63	151,848.14	19,588.49	
General expenses and taxes	71,287.74	67,388.99	3,898.75	
Total	407,469.36	375,474.33	31,995.03	
Net earnings	60,506.96	1,615.12	58,891.84	
Miles operated	131.82	131.15	.67	
Earnings per mile	\$3,550.11	\$2,875.25	\$674.86	
Expenses per mile	3,091.10	2,862.94	228.16	
Net earnings per mile	459.01	12.31	446.70	
Percentage of expenses to earnings	87.07	99.56		12.49

Revenue and expenditures for year.

REVENUE.	
Earnings	\$467,976.32
Receipts of land department	2,194.59
Interest on miscellaneous investments	15.75
Total	\$470,186.66
EXPENDITURES.	
Operating expenses	\$407,469.36
Interest on funded debt	1,944.00
Interest on other debt	2,700.00
Expenses of the land department	2,291.06
Total	414,404.42
Surplus	55,782.24

General balance sheet.

ASSETS.	
Land contracts, land cash, etc.	\$5,281.28
Fuel, material, and stores on hand	45,772.65
Cash on hand	42,956.37
Little Rock and Memphis Railroad Company	9,886.82
Accounts receivable	6,667.29
Due from other companies on account traffic	39,176.89
Total	\$149,741.30

LIABILITIES.

Bills payable	\$45,000.00
Pay rolls and vouchers.....	31,504.14
Due other companies on account traffic.....	4,230.59
Expenses of land department.....	14,345.13
Total	95,079.86
Surplus.....	54,661.44

The capital stock and funded debt are not included among the "liabilities," nor the cost of the road and equipment among the "assets," the statistics not being available to the receiver.

An increase in the net earning from the operation of the road for the year ended June 30, 1898, to \$60,506.96 from \$1,615.12 for the year ended June 30, 1897, and a decrease in the percentage of expenses to earnings of 12.49 per cent are evidences of good management and much-improved transportation conditions.

MISSOURI, KANSAS AND TEXAS RAILWAY COMPANY.

This company was organized April 7, 1870, by the consolidation of the Union Pacific, Southern Branch, chartered September 30, 1865; the Tebo and Neosho, chartered June 18, 1870; the Labette and Sedalia, chartered May 7, 1878; and the Neosho Valley and Holden, whose road was opened in 1871.

The St. Louis and Santa Fe Railroad, from Holden, Mo., to Paola, Kans., 53.52 miles, was acquired by purchase on foreclosure April 29, 1872, and was leased to the Missouri Pacific Railway Company. The Hannibal and Central Missouri, from Hannibal to Moberly, Mo., 72.50 miles, was bought in 1873.

From 1880 to 1888 the road and property of this company were leased to the Missouri Pacific Railway Company, and on the latter date receivers were appointed. The company was reorganized without foreclosure in 1890, and in 1891 the receivers were discharged and the property delivered to the company on July 1 of that year.

By the act of Congress approved March 3, 1863, there were granted to the Union Pacific, Southern Branch, through the State of Kansas, 1,520,000 acres of land. Junction City, Kans., and the southern boundary of Kansas, and Fort Smith, when the Indian title is extinguished, are the land-grant termini. The records of the General Land Office show that to June 30, 1898, there had been patented to the company 704,725.92 acres of land in the State of Kansas. The records of the General Land Office also show that 5,700 acres of railroad indemnity lands, located in Kansas, have been restored to the public domain.

The company owns 1,841.09 miles of road and leases 356.12 miles, making the total length of road operated 2,197.21 miles; there are also 384.08 miles of side track. With the exception of 32.52 miles, the entire track is laid with steel rails of from 52 to 75 pounds per yard in weight. There are 2,450 miles of fencing.

During the year 9,011 tons of new steel rails were laid and 914,022

first-class and 110,921 second-class oak cross-ties and 454 sets of switch ties were placed in the track.

The rolling stock on June 30, 1898, consisted of 258 locomotives, 243 of which are equipped with air brakes; 177 cars in the passenger service, all equipped with air brakes and automatic couplers; 8,546 cars in the freight service, of which 5,332 are fitted with air brakes and 4,893 with automatic couplers; and 1,033 cars in the road and miscellaneous service, of which 141 are fitted with automatic couplers.

The express business is transacted by the American Express Company. Wagner sleeping cars are run over the line on a mileage basis. The telegraph service is performed by the Western Union Telegraph Company. Sundry contracts for the use of tracks have been entered into.

The following statements show the operations for the year and the general balance sheet on June 30, 1898:

Comparative statement of earnings and expenses.

	Year ended—		Difference.	
	June 30, 1898.	June 30, 1897.	Increase.	Decrease.
Earnings:				
Passenger	\$1,919,556.24	\$1,818,188.14	\$101,368.10	
Freight	9,558,999.95	9,107,207.44	451,792.51	
Mail	321,486.19	320,895.53	590.66	
Express	197,427.97	199,949.28		\$2,521.31
Miscellaneous	49,766.45	32,074.73	17,691.72	
Total	12,047,236.80	11,478,315.12	568,921.68	
Operating expenses	7,909,228.20	8,081,521.05		172,292.85
Net earnings	4,138,008.60	3,396,794.07	641,214.53	
Miles operated	2,197.21	2,197.21		
Earnings per mile	\$5,482.97	\$5,224.04	\$258.93	
Expenses per mile	3,599.66	3,678.08		\$78.42
Net earnings per mile	1,883.31	1,545.96	337.35	
Percentage of expenses to earnings	65.65	70.40		4.75

Revenue and expenditures for year.

REVENUE.	
Earnings	\$12,047,236.80
Dividends on stock of other companies	41,000.00
Interest on bonds of other companies	2,500.00
Miscellaneous income	25,590.05
Total	\$12,116,326.85
EXPENDITURES.	
Operating expenses	\$7,909,228.20
Interest on first-mortgage bonds	2,13,760.00
Interest on other funded debt	825,000.00
Interest on bonds guaranteed in lieu of rental	160,000.00
Rentals paid for lease of road	305,409.54
Taxes	273,159.70
Sundry accounts	32,012.51
Total	11,641,569.95
Surplus	474,756.90

*General balance sheet.***ASSETS.**

Cost of road and fixtures.....	\$140, 284, 065. 40
Cost of equipment.....	553, 244. 48
Cost of real estate other than road.....	13, 179. 50
Fuel, material, and stores on hand.....	396, 683. 08
Cash on hand.....	583, 860. 81
Stocks and bonds owned by company.....	694, 870. 96
Bills receivable.....	565. 80
Accounts receivable.....	581, 588. 08
Total.....	\$143, 108, 058

LIABILITIES.

First-mortgage bonds.....	\$50, 023, 000. 00
Interest on same due and unpaid.....	185, 635. 00
Interest on same accrued, not due.....	304, 284. 13
Second-mortgage bonds.....	20, 500, 000. 00
Interest on other funded debt due and unpaid.....	3, 190. 00
Interest on other funded debt accrued, not due.....	368, 333. 34
Street's Western Stable Car Line.....	210, 821. 31
Pay rolls and vouchers.....	1, 243, 132. 11
Due other companies on account traffic.....	5, 534. 32
Taxes accrued, not payable.....	129, 273. 90
Equipment notes deferred until 1900.....	327, 476. 78
Improvement fund.....	538, 889. 42
Sundry accounts.....	20, 311. 93
Capital stock.....	68, 462, 500. 00
Total.....	142, 322, 382
Surplus.....	785, 675

MISSOURI PACIFIC RAILWAY COMPANY.

This company was organized under the general laws of the States Missouri, Kansas, and Nebraska by articles of agreement and consolidation filed in the office of the secretary of the State of Missouri August 12, 1880, and with the secretary of the State of Kansas October 8, 1880. It is the successor of the Pacific Railroad Company of Missouri, which was sold under foreclosure in 1876 and the property conveyed to the present company.

In 1881 this company acquired the St. Louis, Iron Mountain and Southern Railway, issuing three shares of its own stock for every five shares of the Iron Mountain. The company also leased the Central Branch Union Pacific Railroad and the Little Rock and Fort Smith Railway. The reports of operations of these three roads are included in the report of the Missouri Pacific Railway Company, but will be found under the respective heads.

no land department of its own. A grant of land was made to the Pacific Railroad Company to the Southwestern Branch. This branch was purchased by the State and sold to the Southwestern Company, which in turn sold to the Atlantic and Pacific, and on September 8, 1876, it was again sold to the St. Louis and San Francisco Railway Company (which see). The land-grant was in Missouri and Pacific, Mo.

On June 30, 1898, the railroad owned 1,259.98 miles of road and 252.95 miles of total length operated 1,512.93 miles. There are 437.14 miles of track and 437.14 miles of sidings. All but 31 miles of the track are steel rails, and there are 3,140 miles of fencing. 3,389.60 tons of new steel rails were laid at a cost of \$1,161,000. 161 new oak cross-ties were placed under the track. Additions and betterments are charged to operating account and a separate improvement account is kept.

On June 30, 1898, consisted of 337 locomotives, 356 passenger cars, 12,984 in the freight service, and 1,958 freight cars.

The valuation of roadway, bridges, track, buildings, etc., was \$13,172,259, and of all rolling stock and equipment, \$1,161,000.

The statements show the operations of the company for the year ending June 30, 1898:

Comparative statement of earnings and expenses.

	Year ended—		Difference.	
	June 30, 1898.	June 30, 1897.	Increase.	Decrease.
	\$1,760,227.06	\$1,547,589.22	\$212,637.84	
	7,665,862.14	6,243,203.75	1,422,658.39	
	470,212.07	466,261.06	3,951.01	
	160,601.71	138,202.63	22,399.08	
	979,241.52	868,004.58	111,236.94	
	11,036,154.50	9,263,261.24	1,772,893.26	
Structures.....	1,304,251.69	1,170,900.75	133,350.94	
	1,620,672.73	1,267,259.57	353,413.16	
	4,620,740.42	3,905,689.39	715,051.03	
	201,809.15	218,585.96		\$16,776.81
	7,747,473.99	6,562,435.67	1,185,038.32	
	3,288,680.51	2,700,825.57	587,854.94	
	1,512.93	1,512.93		
	\$7,294.55	\$6,122.72	\$1,171.83	
	5,120.84	4,337.56	783.28	
Earnings.....	2,173.71	1,785.16	388.55	
	70.20	70.84		.64

Revenue and expenditures for year.

REVENUE.

Earnings	\$11, 036, 154. 50
Dividends on stocks of other companies	467, 769. 95
Interest on bonds of other companies	72, 187. 50
Profits on miscellaneous investments	318, 117. 65
Branch-line surplus	163, 638. 53
Total	\$12, 057, 868. 13

EXPENDITURES.

Operating expenses, rentals, and taxes	\$8, 509, 997. 78
Interest on funded debt	3, 058, 437. 50
Interest on other debt	90, 984. 91
Compensation retained by United States	1, 476. 46
Sundry amounts	22, 176. 97
Total	11, 683, 073. 62
Surplus	374, 794. 51

General balance sheet.

ASSETS.

Cost of road, fixtures, and equipment	\$50, 787, 635. 95
Real estate other than road	810, 472. 14
Fuel, material, and stores on hand	1, 041, 922. 19
Cash on hand	625, 428. 40
Other stocks and bonds	58, 085, 411. 27
Bills receivable	1, 359. 78
Accounts receivable	4, 960, 503. 77
Total	\$116, 312, 733. 50

LIABILITIES.

Funded debt	\$62, 138, 000. 00
Interest on same, due and unpaid	279, 957. 50
Interest on same accrued, not due	843, 980. 20
Accounts payable	3, 617, 958. 13
Pay rolls and vouchers	2, 489, 129. 14
Capital stock	47, 447, 075. 00
Total	116, 815, 099. 97
Deficit	503, 366. 47

NORTHERN PACIFIC RAILWAY COMPANY.

This company was chartered originally March 15, 1870, as the Superior and St. Croix Railroad Company, and changed its name in July, 1896, by resolution of stockholders and directors, to Northern Pacific Railway Company. This company succeeded to the rights, property, and franchises of the Northern Pacific Railroad Company, taking possession of the property on September 1, 1896.

The records of the General Land Office show that 8,946,400 acres of railroad indemnity lands, located in Wisconsin, Minnesota, Dakota,

Montana, Idaho, Washington, and Oregon have been restored to the public domain, and that by a decision of the Commissioner, dated September 13, 1886, affirmed by the Secretary of the Interior, 32,400 acres of the grant located in Washington have also been restored. Also, by order of January 22, 1896, there were restored in the State of Washington some 278,358 acres. By decision of July 9, 1896, the Secretary of the Interior established a new western terminal for the portion of the Northern Pacific Railroad grant declared forfeited by the act of September 29, 1890, which had the effect of adding to the lands already held to have been forfeited about 53,120 acres which were restored to entry under instructions of August 20, 1896. By decision of August 27, 1896, the final eastern terminus of said grant was fixed at Duluth, Minn., which decision had the effect of restoring to entry all lands previously withdrawn for the company lying east of the terminal established pursuant thereto and approved by the Secretary December 24, 1896. The lands affected lie within the State of Minnesota and the State of Wisconsin, but the quantity has not been ascertained, for the reason that to do so would require a large amount of work and the result would be of no material benefit.

The records of the General Land Office show that to June 30, 1898, there had been patented to this company in the States of—

	Acres.
Minnesota	1, 749, 673. 91
North Dakota	8, 258, 014. 70
Oregon	158, 322. 25
Washington	6, 866, 177. 59
Idaho	248, 091. 84
Montana	4, 758, 462. 37
Total	22, 038, 742. 66

All the lands unsold of the Northern Pacific Railroad Company lying west of the Missouri River were purchased by this company under the reorganization, the aggregate price paid therefor being \$5,605,200. The lands of the old company lying east of the Missouri River are in the hands of the receivers, but steps are in progress to acquire them for the new company.

The company reports that it received during the year ended June 30, 1898, by United States patent, 693,993.70 acres, and disposed of 6,577,455.56 acres. The total cash receipts amounted to \$6,273,001.87, and there were outstanding on account of time sales \$546,300.49.

There are 4,514.36 miles owned and 10.09 miles leased, making the total operated 4,524.45 miles. In addition there are 48.49 miles of double track and 727.22 miles of sidings. There are 1,890.22 miles of fencing. During the year 24,646 tons of new steel rails were laid, at a cost of \$471,012.72, and 2,065,734 new cross ties were placed in the track, at a cost of \$485,254.19. The additions and betterments to railway, etc., charged to construction account, amounted to \$1,064,778.85, and to operating expenses, \$811,709.35. Additions to rolling stock,

charged to equipment account, amounted to \$278,011.33. The equipment at the close of the year consisted of 542 locomotives and 439 cars in the passenger, 18,785 in the freight, and 1,903 in the miscellaneous departments, respectively.

The following statements show the operations for the year ended June 30, 1898, and the company's balance sheet on that date:

Comparative statement of earnings and expenses.

	Year ended—		Difference.	
	June 30, 1898.	June 30, 1897.	Increase.	Decrease.
EARNINGS.				
Passenger	\$4,853,799.04	\$3,627,305.82	\$1,226,493.22	.....
Freight	17,432,754.78	13,605,064.46	3,827,690.32	.....
Mail	615,067.65	603,746.32	11,321.33	.....
Express	362,988.90	254,537.04	8,451.86	.....
Miscellaneous	415,107.94	309,296.51	105,811.43	.....
Total	23,679,718.31	18,399,950.15	5,279,768.16	.....
EXPENSES.				
Maintenance of way and structures	3,137,504.05	3,852,038.12	.....	\$714,534.07
Maintenance of equipment	1,721,765.34	1,632,937.99	88,827.35	.....
Conducting transportation	5,572,645.06	5,695,278.55	.....	122,633.49
General expenses and taxes	1,346,256.46	1,680,899.80	.....	334,643.34
Total	11,778,170.91	12,881,154.46	.....	1,102,983.55
Net earnings	11,901,547.40	5,518,795.69	6,382,751.71	.....
Miles operated	4,524.45	4,532.15	.....	7.70
Earnings per mile	\$5,233.72	\$4,059.87	\$1,173.85	.....
Expenses per mile	2,603.22	2,842.17	.....	\$238.95
Net earnings per mile	2,630.50	1,217.70	1,412.80	.....
Percentage of expenses to earnings	49.74	70.11	.....	20.37

Revenue and expenditures for year.

REVENUE.

Earnings	\$23,679,718.31
Dividends on stocks of other companies	602,431.03
Interest on bonds of other companies	115,426.87
Profits on investments	12,745.74
Interest on investments and cash balances	144,629.26
Miscellaneous receipts	11,963.65
Balance profit and loss, June 30, 1897	489,828.90
Total	\$25,056,743.76

EXPENDITURES.

Operating expenses and taxes	\$11,778,170.91
Interest on bonds	6,079,160.00
New construction	515,709.35
New equipment	296,000.00
Dividends Nos. 1, 2, 3, and 4	3,000,000.00
Reserve for dividends on preferred stock	3,000,000.00
Total	24,669,040.26
Surplus	387,703.50

General balance sheet.

ASSETS.

Cost of road and fixtures	\$296, 626, 459. 40
Cost of equipment	13, 202, 220. 34
Land contracts and land cash	286, 313. 06
Fuel and material on hand	1, 664, 404. 42
Cash on hand	8, 630, 933. 72
Company stocks and bonds owned by company	2, 523, 360. 30
Other stocks and bonds	1, 214, 353. 41
Miscellaneous investments	180, 000. 00
Insurance fund assets	500, 000. 00
Sinking fund in hands of trustees	161, 173. 44
Bills receivable	304, 664. 13
Accounts receivable	1, 427, 206. 76
Due from other companies	492, 968. 99
Due from United States	257, 450. 48
Total.....	\$327, 471, 508, 45

LIABILITIES.

Mortgage bonds	\$159, 743, 400. 00
Interest on same due and accrued	1, 180, 596. 50
Interest on same accrued not due.....	433, 805. 00
Dividends unpaid	750, 000. 00
Accounts payable	444, 666. 37
Pay rolls and vouchers	2, 054, 198. 43
Due other companies	153, 892. 72
Taxes accrued not due	435, 742. 96
General first-mortgage conversion fund.....	2, 756, 600. 00
Reserve fund	100, 060. 25
Insurance fund	500, 000. 00
Reserve for dividends and preferred stock.....	3, 000, 000. 00
Liquidation fund	531, 042. 72
Capital stock	155, 000, 000. 00
Total.....	327, 083, 804. 95
Surplus.....	387, 708. 50

OREGON AND CALIFORNIA RAILROAD COMPANY.

This company was chartered March 17, 1870, as the successor of the Oregon Central Railroad Company of Salem. The road is leased to the Southern Pacific Company for thirty-four years from August 1, 1893, at an annual rental of \$5,000. Under the lease the net earnings or income, after payment of all fixed charges, is applied to payment of interest on bonded indebtedness of lessor company, which company is entitled to residue of such net earnings up to 7 per cent on preferred and 6 per cent on common stock, any excess of such amounts to be retained by lessee. If excess of net earnings or income is insufficient to pay the interest, it is optional with lessee to make good the deficiency

and reimburse itself out of subsequent earnings. The lessee guarantees the payment, principal and interest, of the bonds already issued or to be issued under mortgage of July 1, 1887, from lessor company to Union Trust Company of New York.

By acts of Congress approved July 25, 1866, and May 4, 1870, there were granted by the United States to aid in the construction of this road 4,700,000 acres of land in the State of Oregon. Roseville Junction, Cal., and Portland, Oreg., are the land-grant termini. The records of the General Land Office show that to June 30, 1898, there had been patented to the company 2,345,020.25 acres. The records of the General Land Office also show that to the same date 810,880 acres of the grant of July 25, 1866, and the whole of the grant of May 4, 1870, had been forfeited by the company, and that 1,800,000 acres of railroad indemnity lands located in Oregon had been restored to the public domain.

The company reports that to June 30, 1898, it had received by United States patent 2,561,685.30 acres of land, and had disposed of, for cash and on time contracts (not including canceled contracts), 504,606.53 acres. The total cash receipts from all sales to date amounted to \$1,069,513.25, and there were outstanding on account of time sales \$792,990.38. The receipts for the year were \$49,183.50 and the expenses \$73,183.06. The average price per acre now asked for land is \$3.

The main line extends from Portland to California State line, 367.22 miles, and there are 288.54 miles of branch lines (including 1.72 miles leased). There are also 79.58 miles of sidings. The track is laid with steel rails for 659.94 miles and with iron for 73.67 miles. The ballast consists of 419.03 miles of gravel. There are 571.29 miles of fencing. During the year 234,629 new cross-ties were placed in the track, at a cost of \$69,634.25. The expenditures for additions and betterments to railway, etc., charged to construction account, amounted to \$116,712.43, while the equipment account shows a credit of \$10,128.28. The rolling stock at the end of the year consisted of 52 locomotives, and 69 cars in the passenger, 1,029 in the freight, and 35 in the miscellaneous departments, respectively.

The main line of the road was traveled over by the commissioner in September and was found to be in very good condition. The assessed valuation of roadway, bridges, track, buildings, etc., for taxation is \$3,165,506, and of rolling stock and equipment \$288,340.

The following statements show the operations for the year and the company's general balance sheet on June 30, 1898:

Comparative statement of earnings and expenses.

	Year ended—		Difference.	
	June 30, 1898.	June 30, 1897.	Increase.	Decrease.
EARNINGS.				
Passenger	\$876, 672.26	\$647, 459.18	\$229, 213.08	
Freight	1, 064, 694.88	636, 414.71	428, 280.17	
Mail	106, 956.72	107, 231.66		\$274.94
Express	26, 790.41	25, 175.62	1, 614.79	
Miscellaneous	32, 736.96	19, 756.03	12, 980.93	
Total	2, 107, 851.23	1, 436, 037.20	671, 814.03	
EXPENSES.				
Maintenance of way and structures	439, 154.42	393, 329.44	45, 824.98	
Maintenance of equipment	181, 463.83	146, 838.57	34, 625.26	
Conducting transportation	662, 600.08	498, 469.75	164, 130.33	
General expenses and taxes	115, 306.59	165, 981.12		50, 674.53
Total	1, 398, 524.92	1, 204, 618.88	193, 906.04	
Net earnings	709, 326.31	231, 418.32	477, 907.99	
Miles operated	655.76	655.76		
Earnings per mile	\$3, 214.36	\$3, 189.88	\$1, 024.48	
Expenses per mile	2, 132.68	1, 836.96	295.70	
Net earnings per mile	1, 081.68	352.90	728.78	
Percentage of expenses to earnings	66.80	83.88		17.58

Revenue and expenditures for year.

REVENUE.

Earnings	\$2, 107, 851.23
Interest on land sales	11, 351.24
Receipts of land department	59, 045.88
Interest on sinking fund	1, 581.54
Rent	5, 000.00
Miscellaneous	500.13
Discount on bond purchase account of sinking fund ..	9, 500.00
Total	\$2, 194, 830.02

EXPENDITURES.

Operating expenses and taxes	\$1, 398, 524.92
Interest on first mortgage bonds	950, 850.00
Interest on other debt	153, 427.51
Rentals	52, 973.61
Land contracts canceled	8, 646.42
Expenses of the land department	73, 183.06
Sundry expenses	239.05
Total	2, 637, 844.57
Deficit	443, 014.55

General balance sheet.

ASSETS.

Cost of road, fixtures, and equipment	\$36,608,220.95
Real estate other than road.....	37,068.73
Land contracts, land cash, etc.....	628,732.44
Cash on hand	871.52
Stocks and bonds	479,000.00
Sinking fund	59,220.71
Accounts receivable.....	8,773.51
Tota	\$37,821,907.86

LIABILITIES.

First-mortgage bonds	\$19,587,000.00
Dividends unpaid.....	2,045.73
Accounts payable.....	3,614,465.68
Pay rolls and vouchers.....	1,091.98
Capital stock	19,000,000.00
Total	42,204,603.39
Deficit.....	4,382,695.53

ST. JOSEPH AND GRAND ISLAND RAILWAY COMPANY.

The St. Joseph and Grand Island Railroad Company was formed June 22, 1885, by a consolidation of the Grand Island and Marysville and the St. Joseph and Marysville Railroad companies, and its entire main line was opened to public business on October 1, 1879. In 1893 the road passed into the hands of the Union Pacific Railway receivers, which company owned a majority of the capital stock of this company. On December 23, 1896, the property of the company was sold, after a long default, in foreclosure of the first mortgage, and was purchased for the first-mortgage bondholders' committee in the name of Mr. Olcott, the chairman, the amount of his bid being \$3,000,000. The purchaser then caused new corporations to be formed in Kansas and Nebraska, which were subsequently (February 23, 1897) consolidated to form the St. Joseph and Grand Island Railway Company. The property was turned over to the new company on March 1, 1897. The Kansas City and Omaha Railroad Company was sold under foreclosure on July 8, 1896, and reorganized in September, 1896, as the Kansas City and Omaha Railway Company, which took possession of its road on November 1, 1896. Since then that road has been operated by this company under an operating agreement.

By act of Congress approved July 23, 1866, the St. Joseph and Denver City Railroad Company (afterwards St. Joseph and Marysville) received through the State of Kansas a grant of 1,700,000 acres of land to aid in its construction. St. Joseph, Mo., and Grand Island, Nebr., are the land grant termini. The records of the General Land Office show that to June 30, 1898, there had been patented to the company 462,733.24 acres. The companies fail to make a report on the operations of the land department.

The road extends from St. Joseph, Mo., to Grand Island, Nebr., a distance of 251.06 miles, in addition to which there are 36.27 miles of sidings. The track is laid entirely with steel rails, 161.26 miles of 60-pound weight and 89.80 miles of 52-pound weight. There are 308 miles of fencing.

During the year 2,097.66 tons of new steel rails were laid in the track at a cost of \$43,100.88, and 119,138 oak cross ties were placed in the track at a cost of \$55,755.98. The rolling stock now consists of 26 locomotives and 18 cars in the passenger, 627 in the freight, and 94 in the miscellaneous departments, respectively.

The assessed valuation of the roadway, bridges, track, buildings, etc., for taxation was \$1,830,892.

The following statements show the financial condition of the company on June 30, 1898:

Revenue and expenditures for the year.

REVENUE.	
Earnings	\$1,233,499.06
Interest on deposits	852.53
Total	\$1,233,351.59
EXPENDITURES.	
Operating expenses and taxes	\$823,865.58
Interest on first-mortgage bonds	70,000.00
New construction	28,085.08
New equipment	12,759.67
Dividends	274,880.00
Total	1,209,590.33
Surplus	23,761.26

General balance sheet.

ASSETS.	
Cost of road and fixtures	\$16,629,015.37
Cost of equipment	406,943.30
Material on hand	67,424.79
Cash on hand	216,922.52
Accounts receivable	43,701.32
Due from other companies	4,135.75
Prepaid insurance	1,298.13
Total	\$17,369,441.18
LIABILITIES.	
First-mortgage bonds	\$3,500,000.00
Interest due	3,020.00
Interest accrued not due	35,000.00
Dividends unpaid	137,440.00
Pay rolls and vouchers	100,032.48
Hospital fund	6,614.23
Taxes accrued not due	32,795.79
Capital stock	13,527,600.00
Total	17,342,502.50
Surplus	26,938.68

ST. LOUIS AND SAN FRANCISCO RAILROAD COMPANY.

This company was incorporated June 29, 1896, as the successor of the St. Louis and San Francisco Railway Company, the road of the latter having been purchased by the present company at foreclosure sale on June 27, 1896, as mentioned in a previous report. The road of this company was originally the Southwest Branch of the Pacific Railroad of Missouri, and received a grant of land and a loan from the State to aid in its construction. Failing in the payment of interest on State bonds, the road was sold to the South Pacific Railroad Company, and subsequently to the Atlantic and Pacific Railroad Company, which extended the road to its present terminus. This company was succeeded by the St. Louis and San Francisco Railway Company, above mentioned.

By act of June 10, 1852, there were granted to the Southwest Branch of the Pacific Railroad of Missouri 1,161,235.07 acres of land, and by act of July 27, 1866, to the Atlantic and Pacific Railroad Company 699,351.57 acres in Missouri, now owned by this company, making a total of 1,860,586.64 acres granted. The records of the General Land Office show that to June 30, 1898, there had been patented to the company 1,161,284.51 acres.

The company in its report to the stockholders states that it has received on account of the South Pacific grant 1,161,244.47 acres, of which there has been sold 1,076,740.44 acres, leaving on hand 84,504.03 acres; and on account of the Atlantic and Pacific grant 506,816.33 acres, of which there has been sold 502,093.01 acres, leaving on hand 4,723.32 acres, or a total from the two grants of 89,227.35. The lands and town lots on hand are valued at \$198,674.70, and the existing contracts at \$63,288.26. The net profit from the land department during the year amounted to \$29,160.31.

The St. Louis, Salem and Arkansas Railroad and the Kansas City and Southwestern Railroad, both of which were formerly leased by this company, were sold at foreclosure and now form integral parts of this company. The Central division of the Atlantic and Pacific Railroad was purchased by this company at the foreclosure sale and since January 1, 1898, has been operated as the Southwestern division. The main line of this company extends from St. Louis to Seneca, Mo., 326.28 miles, and there are 955.85 miles of branch lines, making the total length of road owned and operated 1,282.13 miles. In addition, there are 230.11 miles of side track. All but 129.65 miles is laid with steel rails.

During the year 5,250 tons of new steel rails were laid, costing \$95,399.41, and 403,965 new cross-ties were placed in the track, costing \$131,141.53. The rolling stock at the end of the year consisted of 196 locomotives and 140 cars in the passenger, 5,905 in the freight, and 223 in the road and miscellaneous departments, respectively.

The following statements show the operations for the year and the company's balance sheet on June 30, 1898:

Comparative statement of earnings and expenses.

	Year ended—		Difference.	
	June 30, 1898.	June 30, 1897.	Increase.	Decrease.
EARNINGS.				
Passenger	\$1,248,480.94	\$1,026,002.67	\$221,888.27	
Freight	5,121,683.41	4,477,018.96	644,664.45	
Mail	201,508.08	189,781.55	11,726.53	
Express	208,642.03	197,488.48	6,153.55	
Miscellaneous	111,143.31	102,444.51	8,698.80	
Total	6,886,467.77	5,993,336.17	893,131.60	
EXPENSES.				
Maintenance of way and structures	754,237.90	648,704.40	105,533.50	
Maintenance of equipment	635,684.90	544,518.74	91,166.16	
Conducting transportation	2,400,868.01	2,054,176.92	346,692.09	
General expenses and taxes	454,077.95	424,382.27	29,695.68	
Total	4,244,869.76	3,671,782.33	573,087.43	
Net earnings	2,641,598.01	2,321,553.84	320,044.17	
Miles operated	1,282.18	1,162.05	120.08	
Earnings per mile	\$5,371.12	\$5,157.55	\$213.57	
Expenses per mile	3,810.79	3,159.74	151.05	
Net earnings per mile	2,060.33	1,997.81	62.52	
Percentage of expenses to earnings	61.64	61.27	.37	

Revenue and expenditures for year.

REVENUE.	
Earnings	\$6,886,467.77
Profits on stocks of other companies	40,599.59
Receipts of land department	54,471.03
Balance increase June 30, 1897	231,066.94
Total	\$7,212,605.33
EXPENDITURES.	
Operating expenses	\$4,244,869.76
Interest on bonds and funded debt	2,037,997.33
Losses on donation	1,000.00
Dividends Nos. 2 and 3, first preferred stock	200,000.00
Dividend No. 1, second preferred stock	160,000.00
Total	6,643,867.09
Surplus	568,738.24

General balance sheet.

ASSETS.	
Cost of road, fixtures, and equipment	\$34,904,990.72
Fuel, material, and stores on hand	425,561.79
Cash on hand	788,930.34
Stocks and bonds owned by company	4,752,660.12
Other stocks and bonds	34,693.00

Sinking fund	\$18, 208. 21
Bills receivable	39, 165. 22
Accounts receivable.....	516, 172. 04
Due from other companies.....	17, 207. 91
Cash payment to bond and interest account	9, 746. 00
Miscellaneous accounts.....	17, 891. 85
Total.....	\$91, 525, 227. 20

LIABILITIES.

Mortgage bonds	\$39, 437, 100. 00
Interest on same due and accrued	706, 367. 00
Interest on same accrued, not due	183, 382. 50
Pay rolls and vouchers.....	471, 176. 01
Taxes accrued, not yet payable.....	68, 559. 97
Sinking fund accrued	29, 845. 57
Miscellaneous accounts.....	60, 057. 91
Capital stock	50, 000, 000. 00
Total.....	90, 956, 488. 96
Surplus.....	568, 738. 24

ST. LOUIS, IRON MOUNTAIN AND SOUTHERN RAILWAY COMPANY.

This company was formed on April 30, 1874, by the consolidation of the St. Louis, Iron Mountain and Southern Railway Company (organized March 3, 1871) and the Cairo and Fulton Railroad Company of Arkansas (organized January 12, 1853). The company has since acquired by purchase the following roads: Doniphan Branch Railroad, Jackson Branch Railroad, Kansas City and Southern Railway, Iron Mountain and Helena Railroad, Little Rock, Mississippi River and Texas Railway, and the Houston, Central Arkansas and Northern Railway.

In 1881 practically all the capital stock of this company was acquired by the Missouri Pacific Railway Company, that company issuing three shares of its stock for every four of Iron Mountain. This company, together with its leased line, the Little Rock and Fort Smith Railway, are now operated as a part of the Missouri Pacific system.

By the act of Congress approved February 9, 1853, there were granted to the Cairo and Fulton Railroad (since consolidated with this company), through the States of Missouri and Arkansas, 1,178,411.05 acres of land, all of which has been patented to the company. The land-grant termini are Birds Point, on the Mississippi River, opposite Cairo, Ill., via Poplar Bluff, Mo., Little Rock and Texarkana, Ark. The records of the General Land Office fail to show a grant of land to any of the roads named above; but under "Forfeitures" (Land Office Report, 1888, p. 109) it is stated that "by act of June 28, 1884, the grant to the Iron Mountain of 601,600 acres, from Pilot Knob, Mo., to Helena, was forfeited, and 10,000 acres of railroad indemnity lands located in Missouri and 5,000 acres located in Arkansas have been restored." The

records of the General Land Office do, however, show that to June 30, 1898, there had been patented to the St. Louis, Iron Mountain and Southern Railroad Company 1,388,244.68 acres of land.

The company's report gives the operations of its land department in two divisions, and also the operations of its leased line, the Little Rock and Fort Smith Railroad, as follows:

Missouri division.—Acquired by United States patent, 65,039.60 acres, of which there has been sold for cash and on time contracts 53,731.70 acres. The total cash receipts from all sales to June 30, 1898, amounted to \$374,027.79, and there were outstanding on account of time sales \$11,893.58. The receipts from this department during the year amounted to \$10,679.92 and the expenses to \$2,912.21. The average price per acre now asked for land is \$3.

Arkansas division.—Acquired by United States patent, 1,344,081.57 acres, of which there has been sold and lost by contest 738,803.005 acres, leaving the balance still owned by the company 605,278.565 acres. The total cash receipts from all sales to June 30, 1898, amounted to \$2,778,808.98, and there were outstanding on account of time sales \$108,488.20. The cash receipts from this department during the year amounted to \$83,912.95 and the expenses to \$60,542.38. The remaining lands are held at an average price of \$2.65 per acre.

Little Rock and Fort Smith Railway.—Acquired by patent from the United States, 1,058,431.98 acres, of which there have been sold and lost by contest 517,742.90 acres, leaving the balance still owned by the company 540,689.08 acres. The total cash receipts from all sales to June 30, 1898, amounted to \$2,276,626.68, and there were outstanding on account of time sales \$186,284. The cash receipts from this department for the year were \$28,716.60, the expenses amounting to \$28,048.10. The average price per acre at which the remaining lands are held is \$2.50.

The Little Rock and Fort Smith Railway Company, under an act approved February 9, 1853, received a grant of 1,100,000 acres of land. Argenta, on left bank of Arkansas River, opposite Little Rock, Ark., and Garrison avenue, Fort Smith, Ark., are the land-grant termini. The records of the General Land Office show that to June 30, 1898, there had been patented to the company 1,057,647.55 acres of land.

The St. Louis, Iron Mountain and Southern Railway Company owns 1,428.86 miles and leases 344.91 miles, making the total mileage operated 1,773.77 miles. There are 10.27 miles of double track and 384.13 miles of sidings. The track for 1,763.83 miles is laid with steel rails, and there are 1,938 miles of fencing.

During the year 9,971.30 tons of new steel rails were laid, at a cost of \$213,351, and 950,920 new white-oak cross-ties were placed under the track, at a cost of \$227,513.27. Betterments are effected through expense accounts and no separate improvement account is kept. There were added to the equipment during the year 41 freight cars. The

rolling stock on June 30, 1898, consisted of 248 locomotives, 119 cars in the passenger service, 8,314 in the freight service, and 1,113 in the road and miscellaneous department.

The following statements show the operations of the road for the year and the company's balance sheet on June 30, 1898:

Comparative statement of earnings and expenses.

	Year ended—		Difference.	
	June 30, 1898.	June 30, 1897.	Increase.	Decrease.
EARNINGS.				
Passenger	\$2,082,954.78	\$1,818,191.49	\$264,763.29	
Freight	9,528,681.59	8,243,500.27	1,285,181.32	
Mail	394,622.72	388,546.46	6,076.26	
Express	264,006.48	224,524.02	39,482.46	
Miscellaneous	292,649.48	316,941.17		\$24,301.69
Total	12,562,915.05	10,991,708.41	1,571,211.64	
EXPENSES.				
Maintenance of way and structures	1,654,648.36	1,605,093.70	49,555.66	
Maintenance of equipment	1,297,775.95	1,163,205.41	134,570.54	
Conducting transportation	4,810,296.31	4,811,412.20	498,884.11	
General expenses	250,022.80	276,207.93		26,185.13
Total	8,012,743.42	7,855,919.24	656,824.18	
Net earnings	4,550,171.63	3,635,784.17	914,387.46	
Miles operated	1,773.77	1,773.77		
Earnings per mile	\$7,082.59	\$6,196.80	\$885.79	
Expenses per mile	4,517.37	4,147.06	470.32	
Net earnings per mile	2,565.22	2,049.75	515.47	
Percentage of expenses to earnings	63.78	66.92		-3.14

Revenue and expenditures for year.

REVENUE.

Earnings	\$12,562,915.05
Dividends on stocks of other companies	30,364.93
Interest on bonds	6,675.00
Sundry amounts	8,298.80
Total	\$12,608,253.78

EXPENDITURES.

Operating expenses, rentals, and taxes	\$8,701,317.39
Interest on funded debt	2,348,545.83
Interest on other debt	114,214.72
Compensation returned by the United States on account of land grant	16,945.12
Sundry amounts	15,531.87
Total	11,196,554.93
Surplus	1,411,698.85

*General balance sheet.***ASSETS.**

Cost of road, fixtures, and equipment.....	\$67, 635, 238. 01
Real estate other than road	514, 194. 89
Land contracts, land cash, etc.....	1, 850, 525. 18
Cash on hand	7, 628. 24
Stocks and bonds	8, 021, 874. 03
Bills receivable	7, 147. 66
Accounts receivable	1, 452, 705. 35
Total.....	\$79, 489, 313. 36

LIABILITIES.

Funded debt.....	\$48, 432, 042. 88
Interest on same due.....	492, 845. 09
Interest on same accrued, not due	576, 551. 24
Bills payable	1, 760, 896. 36
Accounts payable.....	179, 319. 55
Capital stock.....	25, 795, 115. 00
Total.....	77, 236, 770. 12
Surplus.....	2, 252, 543. 24

ST. PAUL AND DULUTH RAILROAD COMPANY.

This company was incorporated June 27, 1877, as the successor of the Lake Superior and Mississippi Railroad Company. By the acts of Congress approved May 5, 1864, and July 13, 1886, the company received through the State of Minnesota a grant of 920,000 acres of land. St. Paul and Duluth, Minn., are the land-grant termini.

The records of the General Land Office show that to June 30, 1898, there had been patented to the company 860,855.09 acres of land and 8,000 acres of railroad indemnity lands had been restored to the public domain. The company reports that to June 30, 1898, it had acquired by United States patent 816,083.55 acres and by State swamp-land grant 691,085.55 acres, making a total of 1,507,169.10 acres; sold from same, 567,593.32, leaving the number of acres still owned by the company 939,575.78 acres.

The receipts during the year from the land department were \$249,663.93 and the expenses were \$45,610.67, while there are outstanding on account of time sales \$463,129.58. The average price per acre at which the remaining lands are now held is \$5.

The main line extends from St. Paul to Duluth, a distance of 146.50 miles. The company also owns 28.50 miles of branch road and leases 69.45 miles, making the total mileage operated 244.45 miles. There are 16.50 miles of double track and 134.44 miles of sidings.

Practically all of the track is laid with American steel rails of from 70 to 75 pounds in weight. There are 470 miles of barbed-wire fencing. During the year 139,879 new cross-ties were placed under the track at a cost of \$29,733.78, and 1,704.54 tons of new steel rails were laid.

The equipment at the end of the year consisted of 62 locomotive 72 cars in the passenger service, 2,170 in the freight, and 158 in the road and miscellaneous departments. Track ballast is stone for 167.5 miles, and 76.95 miles earth. The company pays a percentage of its gross earnings in lieu of all taxes.

The express business on the road is transacted by Adams Express Company, under contract dated December 1, 1893, for five years, the latter company paying the company 40 per cent of its gross earnings guaranteed to be not less than \$1,875 per month.

The company has guaranteed the payment, principal and interest, of the following bonds:

Taylors Falls and Lake Superior Railroad, 6 per cent.....	\$210, 00
Duluth Short Line Railway, first mortgage, 5 per cent.....	500, 00

The following statements show the operations of the company for the fiscal year and the general balance sheet on June 30, 1898:

Comparative statement of earnings and expenses.

	Year ended—		Difference.	
	June 30, 1898.	June 30, 1897.	Increase.	Decrease.
EARNINGS.				
Passenger	\$370, 237. 38	\$327, 860. 95	\$42, 376. 43	
Freight.....	1, 229, 436. 12	1, 187, 223. 65	42, 212. 47	
Mail.....	25, 547. 10	25, 562. 15		\$15. 05
Express	22, 500. 00	22, 500. 00		
Miscellaneous	915. 05	957. 67		42. 62
Total	1, 648, 635. 65	1, 564, 104. 42	84, 531. 23	
EXPENSES.				
Maintenance of way and structures	303, 109. 82	254, 159. 35	48, 950. 47	
Maintenance of equipment.....	176, 049. 18	174, 448. 41	1, 600. 37	
Conducting transportation	605, 181. 76	636, 564. 62		31, 382. 86
General expenses and taxes	137, 663. 46	137, 878. 04		214. 58
Total	1, 222, 004. 22	1, 203, 050. 82	18, 953. 40	
Net earnings	426, 631. 43	361, 053. 60	65, 577. 83	
Miles operated.....	244. 45	244. 45		
Earnings per mile	\$6, 744. 26	\$6, 398. 46	\$345. 80	
Expenses per mile	4, 998. 99	4, 921. 46	77. 53	
Net earnings per mile	1, 745. 27	1, 477. 00	268. 27	
Percentage of expenses to earnings	74. 12	76. 91		2. 79

Revenue and expenditures.

REVENUE.

Earnings	\$1, 648, 635. 65
Dividends on stocks of other companies.....	10, 125. 00
Interest on bonds of other companies.....	70. 00
Receipts of the land department.....	249, 663. 93
Interest and exchange.....	5, 162. 53
Rentals.....	20, 240. 78
Total	\$1, 933, 897. 89

EXPENDITURES.

Operating expenses and taxes.....	\$1,222,004.22
Interest on first-mortgage bonds.....	50,000.00
Interest on second-mortgage bonds.....	100,000.00
Right of way	809.85
Dividends 31 and 32, 2½ per cent.....	239,505.50
Reserved for land-grant taxes, 1897.....	47,052.25
Expenses of the land department.....	45,610.67
Rentals.....	135,164.67

Total..... \$1,840,146.66

Surplus..... 93,751.23

General balance sheet.

ASSETS.

Cost of road and fixtures.....	\$10,433,982.55
Cost of equipment	1,670,191.63
Land contracts, land cash, etc.....	463,394.59
Fuel, material, and stores on hand	65,225.84
Cash on hand	422,137.39
Stocks and bonds	1,493,727.94
Miscellaneous investments	63,062.35
Sinking fund in hands of trustees.....	140,838.29
Bills receivable	38,688.16
Due from agents and conductors	48,362.35
Due from other companies.....	20,441.52
Due from individuals	22,612.04
Other assets	136,627.90

Total..... 15,019,292.55

LIABILITIES.

First and second mortgage bonds	\$3,000,000.00
Interest on same due and accrued	325.00
Interest on same accrued not due.....	45,833.33
Bonds guaranteed by company	710,000.00
Interest on other funded debt, due and unpaid.....	50.00
Interest on same accrued not due.....	14,633.33
Dividends unpaid.....	3,011.50
Accounts payable.....	55,908.81
Pay rolls and vouchers.....	155,372.40
Redemption fund for retirement of preferred stock....	75.14
Sinking fund for redemption of Taylors Falls and Lake Superior Railroad bonds	140,838.29
Land account, deferred receipts	488,768.59
Land stumpage income expended prior to July 1, 1888, on improvement of construction and equipment.....	690,776.40
Received from land stumpage income for taxes, 1897..	47,052.25
Capital stock	9,451,169.51

Total..... 14,803,814.55

Surplus..... 215,478.00

ST. PAUL, MINNEAPOLIS AND MANITOBA RAILWAY COMPANY.

This company was organized May 23, 1879, being a successor under a plan of reorganization of the St. Paul and Pacific and First Division St. Paul and Pacific railroad companies. The first-named company had purchased the property, franchises, and lands of the Minnesota and Pacific Railroad Company, which had received a grant of land and begun the construction of the road.

The line of the company is now leased to the Great Northern Railway Company for 999 years, from January 31, 1890, that company guaranteeing payment of interest on this company's bonds and a dividend of 6 per cent per annum on the capital stock, and also paying the expenses of maintaining this company's organization.

By the acts of Congress approved March 3, 1857, March 3, 1865, and March 3, 1871, there were granted to the Minnesota and Pacific Railroad Company, through the State of Minnesota, 885,000 acres, and to the St. Paul and Pacific 1,838,638.95 acres, a total grant of 2,723,638.95 acres of land. St. Paul and Breckenridge, Minn., St. Paul via St. Cloud and Barnesville, Minn., and Cape Vincent, Minn., and East St. Cloud and Sauk Rapids are the land-grant termini. The records of the General Land Office show that to June 30, 1898, there had been patented to these companies 3,005,902.64 acres of land.

The company reports that to June 30, 1898, it had acquired by patent of the State of Minnesota 3,212,769.77 acres, but that 408,926.06 acres have been decreed to the Northern Pacific Railway Company by the United States Supreme Court and 2,171,128.14 acres have been sold, leaving the balance now owned by the company 632,467.32, for which the average price now asked is \$8 per acre. The total cash receipts from all sales to date amounted to \$8,921,680.38, and the amount outstanding on account of time sales was \$1,596,762.14. The receipts from the land department during the year were \$679,096.80 and the expenses \$71,499.26.

The total length of road is 3,813.90 miles, in addition to which there are 50.85 miles of second, third, fourth, fifth, and sixth track, and 523.11 miles of sidings. Of this 3,733.64 miles are now laid with steel rails. No details of the equipment can be given, it all having been leased with the line to the Great Northern Railway Company.

The following statements show the receipts and expenditures for the year and the company's balance sheet on June 30, 1898:

Revenue and expenditures.

REVENUE.

Receipts from land department.....	\$681,233.36
Consolidated-mortgage bonds sold.....	1,495,000.00
Rental under lease to Great Northern Railway Company	4,706,713.27
Total	\$6,882,946.63

EXPENDITURES.

Maintenance of organization.....	\$6, 773. 15
Interest on first-mortgage bonds.....	3, 499, 946. 12
Sinking fund net income.....	609, 734. 10
Construction.....	1, 443, 151. 51
New equipment.....	51, 783. 49
Dividends.....	1, 200, 000. 00
Expenses of land department.....	71, 499. 26
Miscellaneous.....	65. 00
Total.....	\$6, 882, 946. 63

General balance sheet.

ASSETS.

Cost of road and fixtures.....	\$105, 543, 340. 23
Cost of equipment.....	9, 168, 665. 47
Premium on first-mortgage bonds.....	393, 200. 00
Premium on consolidated-mortgage bonds.....	34, 688. 89
Cash on hand.....	7, 942. 60
Accounts receivable.....	65, 467. 02
Total.....	115, 213, 304. 21

LIABILITIES.

Called bonds.....	\$1, 000. 00
Other funded debt.....	86, 025, 484. 85
Pacific extension bonds in hands of trustees.....	242, 424. 24
Pay rolls and vouchers.....	10, 020. 91
Sinking funds uninvested first-mortgage bonds.....	1, 050. 00
Sinking funds uninvested consolidated-mortgage bonds.....	62, 338. 71
Sinking funds first-mortgage bonds redeemed and exchanged.....	5, 927, 400. 00
Sinking funds premium on first-mortgage bonds....	393, 200. 00
Sinking funds consolidated-mortgage bonds redeemed.....	580, 000. 00
Sinking funds premium on consolidated-mortgage bonds.....	34, 688. 89
Capital stock.....	20, 000, 000. 00
Total.....	113, 277, 607. 60
Surplus.....	1, 935, 696. 61

SOUTHERN PACIFIC RAILROAD COMPANY OF CALIFORNIA.

This company was formed by a consolidation on May 14, 1888 (amended November 3, 1892), of the following-named railroad companies:

Southern Pacific Railroad,
 San Jose and Almadon Railroad,
 Pajaro and Santa Cruz Railroad,
 Monterey Railroad,
 Monterey Extension Railroad,

Southern Pacific Branch Railway,
 San Pablo and Tulare Railroad,
 San Pablo and Tulare Extension Railroad,
 San Ramon Valley Railroad,
 Stockton and Copperopolis Railroad,
 Stockton and Tulare Railroad,
 San Joaquin Valley and Yosemite Railroad,
 Los Angeles and San Diego Railroad,
 Los Angeles and Independence Railroad,
 Long Beach, Whittier and Los Angeles County Railroad,
 Long Beach Railroad,
 Southern Pacific Railroad Extension, and
 Ramona and San Bernardino Railroad.

On April 14, 1898, were added the—

Southern Pacific Railroad,
 Northern Railway,
 Northern California Railway, and
 California Pacific Railroad.

The road of this company is leased to the Southern Pacific Company for ninety-nine years, being included in what is known as the "Omni-bus lease," dated March 1, 1885, by the terms of which the lessee company agrees to maintain the road, to pay all fixed and other charges, including interest on bonds and floating debt, and to divide the surplus net profit between the companies, this company to have as its proportion 44 per cent thereof. Betterments and additions are currently made by the lessee, each company being charged with the cost of additions to its separate property.

By the acts of Congress approved July 27, 1866, and March 3, 1871, this company received grants of 14,007,840 acres of land in aid of construction. San Jose and Tres Pinos, Cal.; Huron, via Goshen, Tulare, Mojave, Los Angeles, and the Colorado River opposite Yuma, Ariz.; New Orleans and Morgan City, La., are the land-grant termini. The records of the General Land Office show that to June 30, 1898, there had been patented to the company in the State of California 3,210,099.12 acres; that 3,800,000 acres of railroad indemnity lands located in California have been restored to the public domain, and that by a decision of the Commissioner of the General Land Office, affirmed by the Secretary of the Interior under date of November 2, 1885, there had also been restored to the public domain 550,000 acres of land.

The company reports that it has acquired by United States patent 3,206,854.11 acres, by deeds from master in chancery and by decrees of court 3,090.57 acres, and by cancellation of contracts 471,817.59 acres, making a total of 3,681,762.27 acres. It has disposed of for cash 337,113.325 acres, on time contracts 3,153,523.09 acres, and has lost by decrees of court 11,214.20 acres, making a total of 3,479,422.215. The number of acres still owned by the company for which it has received

patent is 1,040,732.245. The total cash receipts from all of sales land to date have amounted to \$11,277,920.95, and the amount now outstanding on account of time sales is \$2,950,034.57. The receipts from this department during the year were \$112,012.32 and the expenditures \$23,460.62.

The company operates 2,300.40 miles of road. There are 40.51 miles of double track and 573.43 miles of sidings. New 75-pound steel rails, aggregating 3,391.81 tons, were laid during the year at a cost of \$122,045.16, and 364,982 cross-ties, of which 16,413 were treated, were placed in the track, costing \$230,843.27. The additions and betterments to railway, etc., charged to construction account, amounted to \$52,059,914.43, of which \$49,642,427.79 represented consolidations. The betterments to rolling stock amounted to \$212,290.83.

The rolling-stock equipment at the end of the year consisted of 236 locomotives, an increase of 26 over the preceding year, and 414 cars in the passenger service, 5,694 in the freight, and 198 in the miscellaneous departments, respectively.

The assessed valuation of roadway, bridges, track, and rolling stock for taxation was \$20,039,500, or \$9,569.32 per mile. Almost all of the road of this company was traveled over during the past summer by the Commissioner. The properties are kept up to a high standard and show care in maintenance.

The following statements show the operations for the year and the company's balance sheet on June 30, 1893:

Comparative statement of earnings and expenses.

	Year ended—		Difference.	
	June 30, 1892.	June 30, 1893.	Increase.	Decrease.
EARNINGS.				
Passenger	\$4,801,518.90	\$2,970,566.86	\$1,830,952.13	
Freight	9,222,503.83	5,949,863.44	3,272,640.39	
Mail	298,212.48	187,289.36	110,923.12	
Express	250,820.35	168,083.92	82,736.43	
Miscellaneous	504,971.08	274,417.27	230,553.76	
Total	15,078,026.66	9,550,220.85	5,527,805.83	
EXPENSES.				
Maintenance of way and structures	1,756,111.72	1,178,306.68	577,805.04	
Maintenance of equipment	1,487,905.25	945,507.17	552,398.08	
Conducting transportation	5,107,107.29	3,054,428.57	2,052,678.72	
General expenses and taxes	842,570.76	1,079,751.03		\$237,180.27
Total	9,203,595.02	6,257,993.45	2,945,601.57	
Net earnings	5,874,431.66	3,292,227.40	2,582,204.26	
Miles operated	2,300.40	1,784.74	565.66	
Earnings per mile	\$6,554.52	\$5,505.27	\$1,049.25	
Expenses per mile	4,000.86	3,607.45	393.41	
Net earnings per mile	2,553.66	1,897.82	655.84	
Percentage of expenses to earnings	61.04	65.52		4.48

Revenue and expenditures for year.

REVENUE.

Earnings from lease of road, including interest on bonds assumed by lessee	\$5, 845, 315.98
Interest	43, 003. 47
Income from sinking fund of company	330, 128. 33
Receipts of the land department	110, 727. 86
Total	\$6, 329, 175. 64

EXPENDITURES.

Salaries and maintenance of organization	\$4, 728. 85
Interest on first-mortgage bonds	4, 014, 400. 85
Betterments and improvements	543, 148. 74
Sinking fund requirements	215, 000. 00
Surveys, etc., on unconstructed lines	36, 898. 46
Expenses of the land department	23, 460. 62
Taxes on lands	35, 694. 64
Set over to special income account	440, 856. 19
Premium on bonds redeemed	5, 345. 00
Total	5, 319, 533. 35
Surplus	9, 642. 29

General balance sheet.

ASSETS.

Cost of road and fixtures	\$190, 947, 660. 95
Land contracts	2, 377, 944. 83
Cash on hand	53, 883. 20
Cash deposited to credit of trustees	163, 630. 36
Sinking funds in hands of trustees	2, 839, 090. 94
Accounts receivable	3, 875, 466. 66
Total	\$200, 257, 676. 94

LIABILITIES.

First, second, and third mortgage bonds	\$72, 908, 500. 00
Interest on same, due and accrued	168, 550. 00
Accounts payable	4, 769. 10
Trustees' land-grant mortgage	423, 920. 39
Sinking funds uninvested	64, 498. 55
Deferred payments on land contracts	2, 377, 944. 83
Capital stock	100, 924, 000. 00
Total	176, 872, 182. 87
Surplus	23, 385, 494. 07

TEXAS AND PACIFIC RAILWAY COMPANY.

This company was organized under the act of Congress approved March 3, 1871, and the general laws of the State of Texas. By acts of Congress approved June 3, 1856, and March 3, 1871, grants of land were made to roads forming parts of the present system amounting to 22,410,880 acres. Shreveport, La., and the Texas State line, near Waskom, Tex., are the land-grant termini.

The records of the General Land Office show that to June 30, 1898, there had been patented to the New Orleans Pacific (formerly the New Orleans, Baton Rouge and Vicksburg) Railroad Company 980,587.43 acres in the State of Louisiana, and also that by the act of February 20, 1885, there had been forfeited 15,692,800 acres of the grant to the Texas and Pacific, and 352,587 acres of the grant to the New Orleans, Baton Rouge and Vicksburg by the act of February 28, 1887, and that by the same act there had been restored to the public domain 19,000 acres of railroad indemnity lands granted to the Vicksburg, Shreveport and Pacific.

The report of the president to the stockholders gives the assets of the land department on December 31, 1897, as 86,240 acres and a very large number of town lots, also bills receivable (land notes) amounting to \$63,724.34. The cash collections on land and town lots amounted to \$38,347.41. The expenses, including taxes on lands, were \$9,085.10. The average price per acre obtained for land was \$2.94.

The company has submitted to this office a report of its operations for the fiscal year ended June 30, 1898, as required by section 13 of the act of March 3, 1871.

The rolling-stock equipment on June 30, 1898, consisted of 206 locomotives, 140 cars in the passenger service, 4,833 cars in the freight service, and 229 cars in the road-repair department, an increase over the preceding year of 10 locomotives, 1 passenger car, 535 freight cars, and 8 road and repair department cars.

The road is operated in three divisions:

	Miles.
Eastern Division.....	511
Rio Grande Division	621
Louisiana Division.....	367
Total	1,499

The following statements show the operations for the year and the general balance sheet on June 30, 1898:

Comparative statement of earnings and expenses.

	Year ended—		Difference.	
	June 30, 1898.	June 30, 1897.	Increase.	Decrease.
EARNINGS.				
Passenger	\$1,651,113.72	\$1,452,466.95	\$198,646.77	
Freight	5,958,143.28	5,136,451.89	821,691.39	
Mail	244,303.84	243,007.00	1,296.84	
Express	144,000.00	144,000.00		
Miscellaneous	60,041.90	55,065.29	4,976.61	
Rent	1,868.50		1,868.50	
Total	8,059,471.24	7,030,991.13	1,028,480.11	
EXPENSES.				
Conducting transportation	1,978,407.76	1,753,972.56	219,435.20	
Maintenance of way	1,297,424.56	1,189,084.77	108,339.79	
Motive power	1,788,152.32	1,488,764.26	299,388.06	
Maintenance of cars	447,009.49	441,624.54	5,384.95	
General expenses and taxes	407,147.21	437,655.85		\$30,508.64
Total	5,918,141.34	5,316,101.98	602,039.36	
Net earnings	2,141,329.90	1,714,889.15	426,440.75	
Miles operated	1,499	1,499		
Earnings per mile	\$5,376.56	\$4,690.46	\$686.10	
Expenses per mile	3,948.06	3,546.43	401.63	
Net earnings per mile	1,428.50	1,144.03	284.47	
Percentage of expenses to earnings	73.43	75.61		2.18

Revenue and expenditures for year.

REVENUE.

Earnings	\$8,059,471.24
Unclaimed wages charged off	3,823.00
Rentals	53,154.00
Sale 167 first-mortgage bonds	167,000.00
Sundry accounts	177,804.97
Total	\$8,461,253.21

EXPENDITURES.

Operating expenses and taxes	\$5,918,141.34
Accrued interest	1,280,185.83
Rentals	72,393.60
Texas school-fund loan	129,091.67
Sundry amounts	608,365.53
Total	8,008,177.97
Surplus	453,075.24

General balance sheet.

ASSETS.

Equipment	\$80,534,345.59
Buildings	1,798,428.00
Land	138,222.15
Westwego, La	95,159.07
Pacific Suburban Railway	167,954.48
Mortgage bonds reserved to retire first-	
Eastern Division bonds at maturity and	
fund loan	3,784,000.00
New Orleans Pacific Railway	6,712,500.00
California and Texas Railway Construc-	
tion	1,880.37
New Orleans Union Belt Railway	150.00
Fort Worth and Union Depot Company	2,500.00
and Foundry Company, car trust	3,565.55
	604,232.51
Working capital of Red River Line	1,500.00
Land (land notes)	60,911.11
Investments and foreign roads	529,470.74
Due to agents	5,909.42
Wages	8,884.05
On hand	278,681.78
Due to accounts	107,842.31
Total	\$94,836,137.13

LIABILITIES.

Stock	\$38,710,900.00
Mortgage bonds	24,990,952.20
Mortgage income bonds	24,935,587.96
Mortgage eastern division bonds	3,784,000.00
Bonds unredeemed	73,000.00
Subscription, income, and land-grant bonds (retirable	
provisions of reorganization)	294,712.00
Prepaid	10,275.57
Contract obligations	3,565.55
Salaries and pay rolls unpaid	503,925.81
Due to companies	93,646.22
Accrued and accrued	233,480.00
Due taxes	87,339.97
Due to accounts	10,475.42
Land and town lot sales account	56,177.31
Total	93,788,038.01
Plus	1,048,099.12

WISCONSIN CENTRAL RAILROAD COMPANY.

This company has failed to submit, on the form prescribed by this office, a report of its operations for the fiscal year ended June 30, 1898, claiming that, under decisions of the courts, it does not come within the jurisdiction of the Bureau.

The original Wisconsin Central Railroad Company was a reorganization, February 4, 1871, of the Portage, Winnebago and Superior Railroad Company. On January 4, 1879, default having been made in the payment of interest on its bonds, the trustees under the mortgage took possession of the property. On October 31, 1889, the property was again turned over to the company under a plan of reorganization, by the terms of which the trustees hold, under an irrevocable special trust until full interest is regularly paid on all bonds, substantially the entire issue of the capital stock of the company. The road was operated by the Northern Pacific Railroad Company under lease from April 1, 1890, until September 27, 1893, when the lease was terminated by decree of the court for nonpayment of rent.

The Wisconsin Central Company and the Wisconsin Central Railroad Company are a financial unit, the former company owning most of the bonds and substantially all the notes and stock of the latter. For legal reasons, separate corporate existences are maintained, but the accounts are consolidated. Both companies are in the hands of receivers.

By an act of Congress approved May 5, 1864 (13 Stat., 66, sec. 3), there were granted to the State of Wisconsin, to aid in the construction of a railroad "from Portage City, Berlin, Dotys Island, or Fond du Lac, as said State may determine, in a northwestern direction to Bayfield, and thence to Superior, on Lake Superior, every alternate section of public land, designated by odd numbers, for ten sections in width on each side of said road," estimated by the General Land Office to include a grant of 1,800,000 acres of land. The beneficiary under this grant was the Portage, Winnebago and Superior Railroad Company (now Wisconsin Central Railroad Company).

The records of the General Land Office show that to June 30, 1898, there had been patented to the company 835,120.10 acres of land, and that 200,000 acres of railroad indemnity lands located in Wisconsin had been restored to the public domain.

This office has been furnished with a copy of the report of the receivers, under order of court, for the year ended June 30, 1898, from which the following information is compiled:

The railroad company owns 430.13 miles of main track and 61.17 miles of sidings, which is operated by the receivers, and 42.05 miles not so operated. It leases 139.25 miles, and has trackage rights over 27.60 miles.

The following statements show the operations for the year and the receivers' balance sheet for June 30, 1898:

Comparative statement of earnings and expenses.

	Year ended—		Difference.	
	June 30, 1898.	June 30, 1897.	Increase.	Decrease.
EARNINGS.				
Passenger	\$508, 679. 23	\$423, 342. 21	\$80, 337. 02	
Freight	1, 822, 226. 20	1, 545, 908. 61	276, 317. 59	
Mail	49, 285. 98	48, 438. 34	847. 64	
Express	49, 619. 54	49, 755. 95		\$136. 41
Miscellaneous	24, 815. 75	22, 802. 29	1, 513. 46	
Total	2, 449, 136. 70	2, 090, 247. 40	358, 889. 30	
EXPENSES.				
Maintenance of way and structures	364, 134. 30	262, 522. 16	101, 602. 14	
Maintenance of equipment	191, 016. 96	194, 630. 50		3, 613. 54
Conducting transportation	745, 068. 22	628, 549. 80	117, 148. 42	
General expenses and taxes	194, 036. 17	189, 775. 95	4, 260. 22	
Total	1, 494, 875. 05	1, 275, 478. 41	219, 397. 24	
Net earnings	954, 261. 05	814, 768. 99	139, 492. 06	
Miles operated	533. 94	534. 88		. 94
Earnings per mile	\$4, 586. 91	\$3, 907. 88	\$679. 03	
Expenses per mile	2, 799. 70	2, 384. 61	415. 09	
Net earnings per mile	1, 787. 21	1, 523. 27	263. 94	
Percentage of expenses to earnings	61. 04	61. 02	. 02	

Revenue and expenditures for year.

REVENUE.	
Earnings	\$2, 449, 136. 70
EXPENDITURES.	
Operating expenses	\$1, 494, 875. 65
Taxes accrued	88, 019. 84
Interest on bonds	85, 537. 50
Interest, exchange, and discount	8, 228. 74
Accrued rentals	415, 256. 40
Total	2, 091, 918. 13
Surplus	357, 218. 57

General balance sheet.

ASSETS.	
Liabilities paid	\$36, 688. 72
Investments in stocks and bonds	3, 000. 00
Improvement on Chicago, Wisconsin and Minnesota and Milwaukee and Lake Winnebago railroads	634. 81
Car-trust equipment	239, 349. 88
Interest accrued on same	30, 517. 31
Cash	27, 008. 65
Sundry accounts	675, 539. 02
Supplies on hand	110, 612. 55
Total	\$1, 123, 350. 94

LIABILITIES.

Receiver's certificates	\$200,000.00	
Haskell & Barker Car Company	203,448.43	
Vouchers and pay rolls	227,652.38	
Accounts payable	43,371.84	
Interest on certificates	1,250.00	
Equipment and renewal account	9,897.19	
Total		685,619.84
Surplus		437,731.10

The estimates of appropriations submitted and recommended by me for the Bureau for the year ending June 30, 1900, are as follows: Commissioner, \$4,500; bookkeeper, \$2,000; assistant bookkeeper, \$1,800; clerk, \$1,400; clerk, \$1,000; assistant messenger, \$720; traveling expenses for the examination of books and accounts of the subsidized railroad companies and inspecting the property thereof, as required by law, \$1,000; for a map of the United States showing all the railways, for commercial and military uses and purposes, \$1,000; total, \$13,420.

The personnel of the Bureau at present is as follows:

James Longstreet, Commissioner	\$4,500
Alton Angier, bookkeeper	2,000
Lewis W. Haskell, assistant bookkeeper	1,800
Herman Schreiner, clerk	1,400
Miss Kate Schmidt, clerk	1,000
Henry Braxton, assistant messenger	720

It affords me pleasure to commend the general efficiency of the employees of the Bureau.

I have the honor to be, very respectfully, your obedient servant,

JAMES LONGSTREET,
Commissioner.

Hon. C. N. BLISS,
Secretary of the Interior.

REPORT
OF THE
GOVERNMENT DIRECTORS OF THE UNION PACIFIC RAILWAY.

NEW YORK, *September 30, 1898.*

SIR: The Government directors of the Union Pacific Railway Company herewith present their report of the proceedings for the foreclosure of the Union Pacific Railway Company and of the sale of the properties of the company under the decrees of foreclosure in the suits instituted by the United States.

In the report of the Government directors, dated September 4, 1897, the final decree entered in the suit brought by the United States of America against the Union Pacific Railway Company and others on the 29th day of July, 1897, was referred to and the general provisions of the decree stated. That decree directed the sale of what is known as the Union Division of the Union Pacific Railway Company, being generally the railway, with all its appurtenances, between Council Bluffs and Ogden.

The decree also directed the sale at auction of the securities held in the United States Union Pacific sinking fund, and further provided that the cash held in the United States Union Pacific sinking fund should be directly applied and credited upon the subsidy debt.

In pursuance of this decree William D. Cornish, the special master thereby appointed, on Monday, the 1st day of November, 1897, at the city of Omaha, in the State of Nebraska, sold the railroad, franchises, and property described in the decree, which by the said decree of foreclosure were directed to be sold, at public auction. The said properties were sold as an entirety and in one parcel to Louis Fitzgerald and Alvin W. Krech, as purchasing trustees, for the sum of \$39,883,281.87.

At the same time, and under the provisions of the same decree, the said special master also sold the bonds which were held in the United States Union Pacific sinking fund and described in the said decree, as an entirety and in one parcel, to Louis Fitzgerald and Alvin W. Krech, as purchasing trustees, for the sum of \$13,645,250.89.

We further report, as appears from the report of the said William D. Cornish, special master, dated November 24, 1897, that the sale of the said bonds by the United States in the Union Pacific sinking fund was subsequently completely consummated by the purchasing trustees, and the sum of \$13,645,250.89 was fully paid by the said trustees into the Treasury of the United States, and that said bonds have been delivered by the United States of America to the said purchasers in compliance with the terms of the said sale and the requirements of the decree,

We further report, as appears from the report of the said William D. Cornish, special master, dated January 27, 1898, that the sale of the said railroad, franchises, and property made to Louis Fitzgerald and Alvin W. Krech, as purchasing trustees, was subsequently fully consummated, and that the said purchasing trustees have paid to the United States of America the full amount of \$40,253,605.49 in pursuance of their said bid and in compliance with the order of the court entered in the said foreclosure suit and confirming the sale under the decree of foreclosure therein; that the difference between the amount of the said bid, which was \$39,883,281.87 and the amount of the actual payment, which was \$40,253,605.49, was determined by the fact that the bid as made was understood and agreed between the representatives of the United States and the representatives of the purchasers to be a bid for the entire amount of the indebtedness then due to the United States, and as the actual amount of this indebtedness fluctuated from day to day it was determined by the Secretary of the Treasury after the sale, such determination being made as of the 1st of November, 1897, the date of the sale, and the settlement actually made conformed to the determination of the indebtedness so ascertained.

The determination of this indebtedness, made by the Secretary of the Treasury, appears in his official statement of November 1, 1897, and is as follows:

Principal of debt	\$27, 236, 512. 00
Balance of interest paid by the United States	30, 830, 181. 51
Interest accrued and not yet paid (4 months)	381, 530. 24
	<hr/>
	58, 448, 223. 75

CREDITS.

Cash in sinking fund	\$4, 537, 921. 39
Bonds in sinking fund at par	13, 645, 250. 00
Interest due November 1, 1897, on bonds in sinking fund	11, 446. 87
	<hr/>
	18, 194, 618. 26
 Balance due	 40, 253, 605. 49

We further report that at the time of the said sale the sum of \$4,537,921.39 cash was held in the said United States Union Pacific sinking fund in addition to the securities above referred to. That under the terms of the said decree the said amount of cash was applied and credited by the United States in part payment of the subsidy debt of the said Union Pacific Railroad Company to the United States.

We further report that the amounts actually realized by the United States from the said sales and from the provisions of the said decree contained are as follows:

Amount payment for railroad, franchises, and property	\$40, 253, 605. 49
Payment for securities in sinking fund	13, 645, 250. 00
Cash in sinking fund applied	4, 537, 921. 39
Interest collected November 1, 1897, on bonds in sinking fund	11, 446. 87
	<hr/>
Total amount realized	58, 448, 223. 75

In the report of the Government directors, dated September 4, 1897, we approved of the course of the Department of Justice in instituting the foreclosure proceedings above referred to and stated our belief that such course was advantageous to the Government. The reason assigned for this belief was that the guaranteed minimum bid which had been made for the property took effect in January, 1897, and that the situation was substantially the same as if the sale of the property had been

commenced in January, 1897, the minimum bid then made, and the same postponed for further bids until October. This method of proceeding enabled all parties interested during a period exceeding eight months to examine the subject in all its details, and to make such necessary arrangements as would enable them if they should believe the value of the property to be greater than the minimum bid to make a better bid.

During the course of the year 1897 there was a very great appreciation in the value of railroad securities. The Department of Justice was enabled by its position as a party litigant in the foreclosure proceedings to reap the full advantage resulting from this appreciation, and thus to secure for the Government the full payment of the entire indebtedness of the Union Pacific Railroad Company to the United States.

We further report that the second foreclosure suit referred to in our report of September 4, 1897, instituted by the United States of America against the Union Pacific Railroad Company and others, for the foreclosure of that portion of the Kansas Pacific Railroad Company which was subject to the lien of the United States by reason of the issue of subsidy bonds was also prosecuted to a final decree, which was entered in the circuit court of the United States for the district of Kansas on the 30th day of July, 1897.

In pursuance of this decree William D. Cornish, the special master thereby appointed, on the 16th day of February, 1898, at the city of Topeka, in the State of Kansas, sold the railroad, franchises, and property described in the decree and which by the said decree were directed to be sold at public auction. That the said properties were sold to Louis Fitzgerald and Alvin W. Krech, as purchasing trustees, for the sum of \$6,303,000, all of which appears by the report of the special master on file in the records of the said court, dated February 16, 1898.

We further report, as appears from the report of the said William D. Cornish, special master, dated May 12, 1898, that the sale of the said railroad, franchises, and property made to Louis Fitzgerald and Alvin W. Krech, as purchasing trustees, was subsequently fully consummated, and that the said purchasing trustees have paid to the United States of America the full amount of their said bid of \$6,303,000, which amount constitutes a full compliance with the requirements of the decree of foreclosure and the order confirming said sale as respects the payment of the said bid.

We further report that it appears from the report of the said master in the case affecting the Union Division, which report is dated January 27, 1898, that the said purchasing trustees duly transferred and assigned their said bid and all their rights as bidders and purchasers at said sale of said railroad, franchises, and property to the Union Pacific Railroad Company, a corporation organized under the laws of the State of Utah, and that in like manner it appears from the report of said master, dated May 12, 1898, relating to the sale of that portion of the Kansas Pacific Railroad which was subject to the lien of the United States that the said purchasing trustees have assigned and transferred their said bid and all their rights as bidders and purchasers at said sale of the railroad, franchises, and property to the said Union Pacific Railroad Company. It also appears from both of said reports that the said master has made, executed, acknowledged, and delivered to the said Union Pacific Railroad Company, organized as aforesaid, under the laws of the State of Utah, his deeds as special master in proper form for transferring to the Union Pacific Railroad Company the railroad, franchises, and properties sold under the said decrees of foreclosure.

We further report that in both of the above-mentioned decrees the

railroad, franchises, and property sold are expressly declared to be sold subject to the following provision:

Saving and excepting the right of the United States Government to have the preference at all times in the use, at fair and reasonable rates of compensation, not to exceed the amounts paid by private parties for the same kind of service, of the said telegraph line and railroad for the transmission of dispatches over said telegraph line and the transportation of mails, troops, and munitions of war, supplies and public stores upon said railroad for the Government whenever required by any department thereof.

We further report that the entire indebtedness of the United States for subsidy bonds issued on the line of the Kansas Pacific Railroad Company, including interest to April 1, 1897, was \$12,891,900.19; that after deducting therefrom the amount realized at the said sale—that is to say, \$6,303,000—there still remains due to the United States the sum of \$6,588,900.19. Proceedings have been instituted against the Union Pacific Railway Company by the Department of Justice in the circuit court of the United States for the district of Nebraska, by which it is claimed that the United States be allowed the said principal sum of \$6,588,900.19, together with interest upon the sum of \$12,891,900.19 from April 1, 1897, to February 16, 1898, and also interest on \$6,588,900.19 from February 16, 1898.

That there remains in the hands of the receivers of the Union Pacific Railway Company appointed in the suit in which Oliver Ames, second, and others are complainants, and the Union Pacific Railway Company and others are defendants, an amount of securities and assets which are not covered by any specific lien or incumbrance and which are available for the payment or part payment of the general obligations of the Union Pacific Railway Company which remain unsatisfied. We are not informed as to the precise amount or value of such assets, but we are informed that they exceed \$4,000,000 in amount.

We are not informed as to the precise amount of the claims which have been presented and assert their right of participation, but we are informed that the claims so presented approximate a total of \$60,000,000.

The Government directors further report that the original provision of law under which they hold their position as directors of the Union Pacific Railway Company is contained in section 1 of the act of July 1, 1862. That the said section refers solely to the Union Pacific Railroad Company as then constituted, which covered and embraced the railroad property between Council Bluffs and Ogden. That by the terms of the said section two Government directors were to be appointed by the President of the United States.

That by the thirteenth section of the act of July 2, 1864, which also refers to the Union Pacific Railroad Company, it was provided that the number of directors to be appointed by the President shall be five; that at least one of the said Government directors shall be placed on each of the standing committees of the company and at least one on any other committee that may be appointed; that the Government directors shall from time to time report to the Secretary of the Interior in answer to any inquiries to be made of them touching the condition, management, and progress of the work and shall communicate to the Secretary of the Interior at any time such information as should be in the possession of the Department. Subsequently, in January, 1880, articles of consolidation were entered into between the Union Pacific Railroad Company, the Kansas Pacific Railway Company, and the Denver Pacific Railway and Telegraph Company. Immediately after the completion of said consolidation the question arose as to whether the provisions of

law referred to above in respect of Government directors applied to the consolidated corporation known as the Union Pacific Railway Company, and if so, then as to the extent of the jurisdiction and power of the Government directors in respect of the consolidated property. The said company on the 26th of January, 1880, postponed the decision of the question until the next annual meeting, whereupon the Government directors communicated the fact to the Secretary of the Interior, who submitted the matter to the then Attorney-General of the United States, who on the 8th day of March, 1880, gave the following official opinion:

DEPARTMENT OF JUSTICE,
Washington, March 8, 1880.

Hon. CARL SCHURZ, *Secretary of the Interior.*

SIR: I have received your note of even date, and as I am requested to answer it at once, I reply that in my opinion no consolidation could be made of the Union Pacific Railroad with other companies which should enable them to exclude Government directors therefrom, in the proportion named in the thirteenth section of the act of July 2, 1864. While a consolidation was contemplated, it will be seen by examining the section 16 of that act, which relates to the consolidation of these companies, that it is clearly contemplated thereby that all the provisions for the benefit of the United States, so far as applicable, relating or in any manner appertaining to the companies so consolidated, were to apply and be in force in such consolidated organization.

Very respectfully, your obedient servant,

CHARLES DEVENS,
Attorney-General.

Ever since this opinion was given, the President of the United States has regularly appointed, under the said acts of Congress, five directors of the consolidated company, who have acted and still act with the company's directors in the management of its affairs.

As the original appointment of Government directors had reference solely to the corporation then known as the Union Pacific Railroad Company, which, as before stated, coincides with that portion of the Union Pacific Railway Company known as the Union Division, and embracing the property between Council Bluffs and Ogden, and as the entire indebtedness of the said Union Pacific Railroad Company has been paid and discharged, we desire to be instructed by the Department of the Interior as to whether, as Government directors, we are still chargeable with any duties or obligations in respect of the pending proceedings for the enforcement of the claim of the United States arising out of the above-mentioned deficiency and appertaining to the indebtedness of the Kansas Pacific Railway Company.

All of which is respectfully submitted.

E. ELLERY ANDERSON,
J. W. DOANE,
JOHN SHERIDAN,
WILLIAM J. COOMBS,
JOHN T. BRESSLER,
Government Directors.

Hon. CORNELIUS N. BLISS,
Secretary of the Interior.

REPORT
OF
THE GOVERNOR OF ALASKA.

DISTRICT OF ALASKA, EXECUTIVE OFFICE,
Sitka, October 1, 1898.

SIR: I have the honor to transmit herewith my report on the affairs of Alaska for the year ending June 30, 1898:

LAW IN ALASKA.

LIQUOR TRAFFIC.

The transfer of Alaska into the possession of the United States occurred October 18, 1867. The following July Congress enacted—

That the President shall have power to restrict and regulate or to prohibit the importation and use of firearms, ammunition, and distilled spirits into and within the said Territory. And the exportation of the same from any port or place in the United States when destined for such Territory, in violation of any regulations that may be prescribed under this section; and all such arms, ammunition, and distilled spirits, landed or attempted to be landed or used at any port or place in said Territory, in violation of said regulations, shall be forfeited; and if the value of the same shall exceed four hundred dollars, the vessel upon which the same shall be found, or from which they shall have been landed, together with her tackle, apparel, and furniture, and cargo shall be forfeited; and any person willfully violating such regulation shall, on conviction, be fined in any sum not exceeding five hundred dollars, or imprisoned not more than six months. And bonds may be required for a faithful observance of such regulations from the master or owners of any vessel departing from any port in the United States having on board firearms, ammunition, or distilled spirits, when such vessel is destined to any place in said Territory, or if not destined, when there shall be reasonable grounds of suspicion that such articles are intended to be landed therein in violation of law. And similar bonds may also be required on the landing of any such articles in the said Territory from the person to whom the same may be consigned.

From the time of this enactment down to May 14, 1884, there was no change in the law. There was an endeavor on the part of customs officials on the lower coast and the military authority in the Territory to prevent the importation and use of distilled spirits; but without substantial success. The attempt to suppress the traffic caused some persons to introduce the manufacture of rum among the natives.

This they did by using a 5-gallon coal-oil tin for a still, making a worm of tin, which led down through a barrel of cold water for a condenser. The mash was made of black molasses imported from the Hawaiian Islands. This was carried on to such a degree that the monthly importation of molasses into the Territory was very large, sometimes amounting to hundreds of barrels.

This process was sold by the first natives who were taught it as a sort of patent right. And soon the knowledge was generally diffused among the tribe.

A tribe on Admiralty Island, known as the "Hoochinoos," used to smuggle it to the soldiers at Sitka, and the compound which they sold became known as "hoochinoo" and "hooch."

The harm and havoc which is wrought amongst these native people can hardly be calculated. Its use made them murderous and distorted their bodies, especially their eyes and faces.

Even at this date its manufacture is not suppressed among them. From 1879 to 1884 a vigorous crusade was made by the naval authorities and the evil was greatly checked.

The above statute was enacted for the protection of the few whites, who were in a small minority, as well as for the protection of the natives against themselves; but the consequences of "hoochinoo" making and drinking have been about as ruinous and disastrous amongst the natives as if there had been a free importation and sale of distilled spirits.

Section 14 of the organic act, which was approved May 14, 1884, is as follows:

That the provisions of chapter three, title twenty-three, of the Revised Statutes of the United States, relating to the unorganized Territory of Alaska, shall remain in full force, except as herein specially otherwise provided; and the importation, manufacture, and sale of intoxicating liquors in said district, except for medicinal, mechanical, and scientific purposes, is hereby prohibited, under the penalties which are provided in section nineteen hundred and fifty-five of the Revised Statutes for the wrongful importation of distilled spirits. And the President of the United States shall make such regulations as are necessary to carry out the provisions of this section.

It will thus be seen that "distilled spirits" is broadened out to mean "intoxicating liquors."

The President has made the following regulations to carry the provision of this section into effect:

[Circular.]

EXECUTIVE ORDER CONCERNING THE SALE OF INTOXICATING LIQUORS IN THE TERRITORY OF ALASKA.

TREASURY DEPARTMENT, OFFICE OF THE SECRETARY,
Washington, D. C., March 12, 1892.

For the purpose of more effectually carrying out the law of Congress prohibiting the sale of intoxicating liquors in Alaska, it is ordered that existing rules and regulations regulating the sale of intoxicating liquors in the Territory of Alaska, pursuant to the act of May 17, 1884, are hereby continued in force, except as herein modified:

(1) Existing statutes and regulations relating to the sale of intoxicating liquors shall be strictly enforced.

(2) The sale of intoxicating liquors for medical, mechanical, and scientific purposes shall be made only by such persons in said Territory as have obtained a special permit from the governor of the Territory to sell intoxicating liquors therein, upon the following conditions: That before the application for the permit or renewal thereof shall be granted the applicant shall make and subscribe an oath before an officer authorized to administer oaths in said Territory, as follows:

"I (name) do solemnly swear that I will not sell, give, or furnish any intoxicating liquors to any person otherwise than as provided by law and the regulations established by the President of the United States under the act of May 17, 1884; and especially that I will not sell or furnish any intoxicating liquors to any person who is not known to me personally, or duly identified; nor to any minor, intoxicated person or persons who are in the habit of becoming intoxicated, and that I will not allow any intoxicating liquors to be drunk on or about my premises; and I will make true, full, and accurate returns to all certificates and requests made to or received by me, as required by said regulations; and said returns shall show every

sale and delivery of such liquors made by or for me during the month embraced therein and the true signature to every request received and granted; and such returns shall show all the intoxicating liquors sold or delivered to any and every person as returned."

Such applicant shall also file with his said application a bond to the governor of said Territory, in such penal sum as the governor shall prescribe, not less than \$500, conditioned that for any violation of said act of May 17, 1884, or the regulations established by the President thereunder, said bond shall be forfeited. Such bond shall be signed by the applicant or applicants, as principal or principals, and by at least two sureties, who shall justify under oath in the penal sum of \$500 each over and above all indebtedness and exemptions, and such bond shall be approved by and deposited with the governor. The United States and any person or persons who may be injured or damaged by reason of any violation of said law, or the regulations thereunder, may have an action upon such bond.

Upon taking said oath and filing said bond the governor of said Territory may issue to the applicant a permit authorizing him to keep and sell intoxicating liquors as provided by said act and regulations made thereunder; and every permit so granted shall specify the building, giving the location thereof by street or number, in which intoxicating liquors may be sold by virtue of the same and the length of time the same shall be in force, which in no case shall exceed twelve months.

(3) The sale for medical purposes shall be made only upon the prescription of a reputable practicing physician of said Territory, stating the kind and quantity of liquor necessary to be used by the patient.

(4) The sale for mechanical and scientific purposes shall be made only upon application, duly subscribed and sworn to by the applicant in person, before some person authorized to administer oaths, made by the party desiring to use the same, stating the kind and quantity of liquor required, and that the same is necessary for mechanical or scientific purposes (stating particularly the purpose and the exact locality where to be used).

(5) No licensed person shall sell or deliver any intoxicating liquors to any person if he has reason to believe that the applications, certificates, or affidavits submitted to him by applicants are evasive or untrue; or to any minor, or intoxicated person, or to one addicted to intoxication. If the applicant is not personally known to the person selling, before filing his request he shall require identification by a person known to him, and a statement signed by such witness, that the applicant is not a minor and is not in the habit of using intoxicating liquors to excess, and is worthy of credit as to the truthfulness of the statements in his application.

(6) At the end of each month each licensed person shall make out and forward to the governor an itemized report of the date and quantity sold to each person, and the purpose for which it is bought; and if upon a prescription, the name of the physician giving the same, which report shall be sworn to.

(7) Any person violating these regulations, or the provisions of law relative to the sale of distilled spirits or intoxicating liquors in Alaska, shall be liable, upon conviction in the proper tribunal, to the penalties imposed in section 1955 of the Revised Statutes of the United States; and in any event upon such violation by such person his permit shall be revoked and not renewed without approval of the Secretary of the Interior.

(8) In case any physician makes a false certificate as to matters aforesaid, any certificate thereafter shall be rejected and no application shall be granted thereon; and in any case when a false affidavit is made, all applications by such person thereafter shall be rejected. Copartnerships, corporations, and all associations are included within the foregoing rules.

(9) The governor shall have power to suspend or revoke any permit issued by him to any person whenever, in his judgment, it is shown, after due notice, that such person has failed to comply with the rules and regulations prescribed herein, or that the best interests of the inhabitants of the Territory require such suspension or revocation of the permit.

(10) Every person who, under these regulations, shall have obtained a special permit from the governor of the Territory of Alaska to sell intoxicating liquors for medical, mechanical, and scientific purposes, will also be required to pay to the collector of internal revenue of the district of Oregon (in which collection district the Territory of Alaska is included) the special tax as a liquor dealer, and in all other respects to comply with the internal-revenue laws.

O. L. SPAULDING, *Acting Secretary.*

EXECUTIVE MANSION, *March 11, 1892.*

Approved.

BENJ. HARRISON.

[Circular.]

EXECUTIVE ORDER CONCERNING THE IMPORTATION OF INTOXICATING LIQUORS AND BREECH-LOADING RIFLES AND AMMUNITION INTO THE TERRITORY OF ALASKA.

TREASURY DEPARTMENT, OFFICE OF THE SECRETARY,
Washington, D. C., May 4, 1897.

The following regulations are prescribed under the authority of section 14 of the act of May 17, 1884, entitled "An act providing a civil government for Alaska," and section 1955 of the Revised Statutes:

(1) No intoxicating liquors shall be landed at any port or place in the Territory of Alaska without a permit from the chief officer of the customs at such port or place, to be issued upon evidence satisfactory to such officer that the liquors are imported and are to be used solely for sacramental, medicinal, mechanical, or scientific purposes.

(2) The importation into said Territory of breech-loading rifles and suitable ammunition therefor, except for the personal use of white settlers or temporary visitors not traders, is hereby prohibited.

(3) The master of any vessel departing from any port in the United States having on board intoxicating liquors or breech-loading rifles and ammunition suitable therefor, when such vessel is destined to any place in said Territory, or, if not so destined, when the intended course lies within the waters of the Territory, will be required to file with the collector of customs at the port of departure a special manifest, signed and verified in duplicate, of all of such liquors, arms, and ammunition; and no clearance will be granted to any such vessel unless the articles embraced in the special manifest are shown to the satisfaction of the collector to belong to the necessary supplies and equipment of the vessel, or to be entitled to the above specified exemptions, or are covered by bonds taken under the provisions of said section 1955.

(4) One of the special manifests above provided for will be delivered to the master, together with the clearance, if granted, and any intoxicating liquors, breech-loading rifles, and ammunition found on board a vessel within the waters of the Territory without such special manifest will be seized and the offenders prosecuted under the provisions of section 1957, Revised Statutes.

C. S. FAIRCHILD, *Secretary.*

Approved.

GROVER CLEVELAND.

[Executive order.]

TREASURY DEPARTMENT, OFFICE OF THE SECRETARY,
Washington, D. C., June 24, 1898.

For the purpose of more effectually enforcing the law prohibiting the introduction of intoxicating liquors into the Territory of Alaska, the following regulations are prescribed under the authority of section 14 of the act of May 17, 1884, entitled "An act providing civil government for Alaska," and section 1955 of the Revised Statutes.

(1) The introduction into the Territory of Alaska of intoxicating liquors and shipment, or attempted shipment, of such liquors from any port or place in the United States to said Territory is hereby prohibited.

(2) The above prohibition shall not apply to intoxicating liquors intended for sacramental, medical, mechanical, or scientific purposes in said Territory of Alaska, but all liquors intended to be so used may be shipped from the United States and landed in the Territory of Alaska only upon a permit first obtained from the chief customs officer of the customs district of Alaska, to be issued only upon evidence satisfactory to such officer that such liquors are to be used solely for sacramental, medical, mechanical, or scientific purposes.

(3) All intoxicating liquors shipped or attempted to be shipped from any port or place in the United States with the intention or purpose of their introduction into the Territory of Alaska, and all such liquors imported or introduced, or attempted to be imported or introduced, into said Territory of Alaska in violation of law or these regulations, are liable to seizure and forfeiture and may be seized by any customs officer of the United States and proceeded against in the manner provided by law.

(4) The master of any vessel departing from any port in the United States having on board any intoxicating liquors, when such vessel is destined to any place in said Territory, or, if not so destined, when the intended course lies within the waters of the Territory, will be required to file with the collector of customs at the port of departure a special manifest, signed and verified in duplicate, of all such liquors;

and no clearance shall be granted to any such vessel unless the articles embraced in the special manifest are shown, to the satisfaction of the collector at said port of departure, to belong to the necessary medical supplies of the vessel or to be entitled to the above-specified exemption, or are covered by bonds taken under the provisions of section 1965 of the Revised Statutes.

(5) One of the special manifests above provided for will be delivered to the master, together with the clearance, if granted, and any intoxicating liquors above mentioned found on board a vessel within the waters of the Territory without such special manifest will be seized and the offenders prosecuted under the provisions of section 1957 Revised Statutes.

LYMAN J. GAGE, *Secretary.*

Approved.

WM. MCKINLEY.

Then the only plea by which intoxicating liquors may be lawfully introduced into Alaska is for medicinal, mechanical, and scientific purposes, and then only by permission of the collector of customs, as the following letter from the Treasury Department will emphasize:

TREASURY DEPARTMENT, *April 27, 1898.*

SIR: I have the honor to acknowledge the receipt of your letter of the 23d instant, containing certain inquiries respecting the enforcement of the liquor laws in your Territory.

Replying thereto, you are informed that in the opinion of the Department, under the regulations prescribed by the President, the license issued by the governor for the sale of liquors within the Territory does not carry with it the right to the importation by the licensee of such quantities and kinds of liquor as he may deem proper in the conduct of his business as a liquor dealer.

The regulations of the President dated May 4, 1887, provide a permit for the importation of liquors into the Territory, to be issued by the chief officer of the customs at the port or place in the Territory where the liquors are intended to be landed.

The Department has held that the collector at Sitka is the chief customs officer at any port within his district.

The Executive order requiring this permit from the collector was not changed by the subsequent order dated March 12, 1892, authorizing the governor to issue licenses for the sale of liquor within the Territory. From this it can be inferred only that the President intended concurrent action by both the collector and the governor as an additional safeguard to the proper enforcement of the law.

Replying to your further inquiry whether the Department can "instruct the collector to approve the permit of the governor," you are informed that under the Executive orders issued by the President and cited above the collector is vested with discretionary power in the matter of issuing permits for the introduction of liquors into the Territory, with which power the Department may not interfere. If, however, your question is intended to ask whether the Department may instruct the collector to approve the licenses issued by the governor for the sale of liquors, you are informed that, while the issuance of such licenses is within the province of the governor, under the administration of Governor Sheakley that officer refused to issue licenses for the sale of liquor unless the application was first approved by the then collector of customs. This, however, was in pursuance of an understanding between the governor and the collector, and the acquiescence of the collector to such an arrangement at the present time could not be secured through instructions from the Department.

Respectfully, yours,

W. B. HOWELL, *Assistant Secretary.*

Hon. J. G. BRADY,
Governor of Alaska.

When liquor has once been imported for these purposes, it will also be necessary to obtain a "special permit to sell" from the governor. This can only be issued under the foregoing restrictions. The bond required is \$1,000. This is the law, but the execution thereof is found to be a matter of great difficulty. In the first place, it is repugnant to nineteen-twentieths of the population. There is no public opinion sustaining it. The large majority of the white population is in the habit of using liquor in some form or other, and a very small number of the people are willingly committed to and approve of prohibition.

Saloons are open in all of the towns and in all of the mining camps. While it is against the law that these should exist, nevertheless the

report of the Commissioner of Internal Revenue for 1897 shows that the deputy officer in Alaska collected a special tax from 147 retail liquor dealers, 6 breweries, 8 retail dealers in malt liquors, and 1 wholesale dealer in malt liquors. This was the status before the rush to the Klondike, and no doubt the number has doubled up to the present writing.

The court has repeatedly endeavored to deal with those who engage in the traffic, but the result has been anything but satisfactory.

If anyone who is interested in this question will place a good map of Alaska before him, he will be convinced that the topography of Alaska makes it an ideal country for the smuggler.

The more that the collector and his force stop the importation of liquors on the steamers, the better it is for those who are engaged in smuggling. The chief smugglers send their orders and checks to Victoria, British Columbia. The liquors are put up according to order and shipped to Port Simpson, which is just across the American line (latitude $54^{\circ} 40'$). Smugglers watch their opportunity to load up at this place and wind their way through the various passages leading north.

The average price which the dealers pay the smuggler is \$7 per gallon for whisky which in the market at Port Townsend is worth from \$2 to \$2.50 per gallon. Hudson Bay rum sells from \$10 to \$12 per gallon. This at Port Townsend or at Seattle is worth \$4 per gallon.

As the retail dealer considers this a high price, he undertakes to adulterate it, and by his villainous compound succeeds in making 2 or 3 gallons out of 1. In one instance last year one of them, not knowing the nature of wood alcohol, mixed it with other ingredients and sold it to a number of natives. In a few hours two of them were dead, and several more would have died had it not been for the timely relief given by the marine-hospital surgeon.

As much as 5,000 gallons have been taken at a time from Port Simpson. For the past year much foreign liquor has gone up to the summits on the Dyea and Skagway trails. A portion of this has found its way back to be sold in the numerous saloons in each of these towns.

The seizures by the custom officers for the past year have probably amounted to 2,500 gallons. The amount of foreign liquor which has been smuggled will probably amount to 60,000 gallons. None of this foreign liquor has at any time brought any revenue to the United States.

From the foregoing one can well understand how there is a constant pressure brought to bear upon the customs officials by the saloon keepers and their friends; and it appears in some instances that the temptation has proved too strong. The grand jury at its last sitting brought indictments against a number of persons for conspiracy to defraud the United States, and five of these were customs officials.

This evil of smuggling could be largely checked if the collector were backed up by three or four revenue cutters and a number of steam launches to patrol the waters of southeastern Alaska. But from past experience it would seem as impossible to prevent smuggling of liquor into Alaska as it would to prevent the clouds from rolling by or the tide from ebbing and flowing.

In an endeavor to obtain the opinions and advice of many of the leading citizens of this Territory, letters were addressed to them on the subject. The following is one of them, with some of the replies:

SITKA, ALASKA, *July 28, 1898.*

DEAR SIR: While you were governor of Alaska you gave your views in regard to the liquor laws for this district in your able and excellent reports. You have been in the Territory much since you were its governor and are now engaged in business

enterprises which bring you in contact with the people. Is the present law satisfactory? If not, what change should we have? I shall be pleased to receive your answer to these inquiries.

Respectfully, yours,
Hon. A. P. SWINEFORD.

JOHN G. BRADY, *Governor of Alaska.*

JUNEAU, ALASKA, July 28, 1898.

DEAR SIR: Yours of this date, asking if the views expressed by me in my official reports, 1885-1888, inclusive, in regard to the regulation of the liquor traffic in Alaska, have since then undergone any change or modification, is before me.

In reply, I can only say that I have been in Alaska much of the time since I resigned the office of governor, February, 1889, and that personal observation from the standpoint of a private citizen earnestly solicitous for the future welfare of the district has but served to strengthen and confirm the views expressed in the official reports to which you allude.

Without intent or desire to cast any reflection upon the honesty of purpose of those who insist upon the retention of the present prohibitory law, but conceding to them the same earnest desire for the public good which I myself profess, I can, nevertheless, but regard their determined opposition to the repeal of the present prohibitory law in the light of a wholly mistaken zeal in behalf of what would ordinarily be considered a good cause, for the simple reason that in the case of Alaska they themselves must, perforce, admit that prohibition has thus far most signally failed to prohibit, or in the least degree promote, the cause of temperance. Nor is it possible that it can do so in the future, even though a revenue cutter be sent to patrol each and every separate and distinct channel of our numerous inland passages.

That the present prohibitory law is unsatisfactory to the people of Alaska goes without saying; that it is approved by those who earnestly desire the greatest possible restriction of the liquor traffic is, to me, most surprising. Were I opposed to the restriction for which they profess such an earnest desire, I should most certainly favor a retention of the present law for the reason that while it satisfies the prohibition zealots, it imposes very little, if any, restraint upon the rumrunner, for the simple reason that its provisions are not, and can not be, enforced.

The present law should be unsatisfactory to Congress itself, and to those charged with the administration of civil government in Alaska—

(1) For the reason that its enforcement is impossible except at an expense ten or a dozen times that which Congress will ever be willing to incur, and even at such expense the enforcement would be only partial. Such partial enforcement would have a prohibitive effect only in so far as it might serve to raise the price of smuggled Canadian liquors, and thus place them beyond the reach of the more or less impetuous tippler.

(2) It is an incentive to the smuggler, who otherwise would find himself with little or no avocation in these waters. The law and regulations under which the shipment of intoxicating liquors from American ports to Alaska can be restrained do not reach the Canadian dealers, consequently a traffic now amounting to nearly, if not quite, a million dollars annually, and which is steadily on the increase, nearly all goes to a foreign country without any resultant revenue to our own Government. In other words, it takes this large trade away from our own licensed and heavily taxed dealers and gives the great bulk of it to the Canadians, who are in no wise bound to observe a law of our own making, but may rather be expected to connive at its violation.

(3) It imposes upon the people of Alaska the most villainous intoxicating compounds at extraordinary high prices, whereas, if they are to have liquors at all (and it may safely be assented that in this climate, more than in any other, they are a necessity to the public health), they should be permitted the best and purest at moderately fair prices. That the quality of the liquors sold in Alaska is of the very worst description, and as such deleterious to the public health, will be quite generally admitted by all who are acquainted with the truth.

(4) It is, in practice, an extension to Alaska of what is elsewhere known as the "wide open" policy, though in its operation it involves the continual violation of the customs laws, as well as of the special prohibitory clauses of the law applicable only to this district.

(5) If rigidly enforced, it would be an infringement of the personal liberties of the people of Alaska, to which, so far as I am informed, no other fragment of American territory or fraction of the American people have ever been subjected by Congressional enactment.

What change should we have? I answer unhesitatingly, a repeal of the present practically dead-letter prohibitory law and the enactment in its stead of a high-

license law. When I say high license, I mean such a license as will be to a large degree prohibitive of the traffic as it is now carried on. A law legalizing the traffic in Alaska and imposing a license of, say, \$1,000 annually on each dealer, would, in my opinion, reduce the number of retail dealers at least 75 per cent and the consumption of intoxicating liquors correspondingly, while, at the same time, the business of the smuggler being destroyed, the quality of the liquors sold would be much improved, and the public health greatly benefited. It is the only way in which the traffic can be regulated and the consumption reduced to a minimum. The proceeds from licenses could be devoted to educational purposes, and would amount to more than Congress is annually asked to appropriate for the education of white children in Alaska.

It is just possible I might be induced to modify the views herein expressed would the honest but misguided prohibition zealots outline a plan whereby the present law can be enforced, even at the expense of hundreds of thousands of dollars annually. But, in my opinion, grand juries may continue to periodically indict, trial juries periodically convict, and the court as regularly inflict fines upon hundreds of dealers, yet will the smuggler continue to ply his vocation, and the widespread sale and consumption of villainous mixtures from bottles ornamented with lying labels go on until checked by some remedy more efficacious than that of an impracticable theory.

Very truly, yours,

A. P. SWINEFORD.

HON. JOHN G. BRADY,
Governor of Alaska.

The following is from Hon. A. K. Delaney, who has filled the offices of collector of customs and United States district judge of the district of Alaska:

JUNEAU, ALASKA, *September 2, 1898.*

DEAR SIR: I have received your communication of the 22d ultimo, concerning the present liquor laws of Alaska, in which you suggest the following interrogatories:

- (1) Do you consider the present liquor laws satisfactory?
- (2) If the laws are unsatisfactory, why is it that they are so?
- (3) What changes would you propose?

Replying seriatim to your interrogatories I will say:

(1) The present prohibitory liquor law is satisfactory to three classes of our people—the prohibitionists, the saloon keepers, and the whisky smugglers. It is satisfactory to the prohibitionist for the reason that, notwithstanding the fact that its effect is to multiply tenfold the evils of the liquor traffic, they believe it to be the expression of a great moral principle.

It is satisfactory to the saloon keepers because it imposes no taxes, restrictions, or regulations, and its violation assures to them a free and wide open business.

It is satisfactory to the smugglers because it affords them an extensive and lucrative business. The two hundred saloons of one sort and another, which have been in operation in Alaska during the past year, offer these people a wide field, and as 90 per cent of the liquors brought in by them are of foreign manufacture, and by the processes of the smuggler escape both internal-revenue and custom-house taxes, the profits of the business are enormous.

It is certainly a strange condition of affairs, but it is nevertheless the truth, that the saloon keepers and liquor smugglers have no better friends than the champions of the present prohibitory liquor law.

(2) The law is unsatisfactory to an overwhelming majority of our people for a multitude of reasons. Many are opposed to sumptuary legislation upon principle. Others, whose good citizenship forbids them to violate the law, would be willing to derive profits from the traffic if it were legalized. Others, engaged in legitimate business—medicinal, mechanical, and otherwise—requiring the use of alcohol and alcoholic liquors, feel a sense of humiliation and annoyance at being obliged to secure permits for such liquors as their business may demand. Others, who make no use of wines, liquors, or beer outside the family, entertain the same feeling with reference to these permits. Another very large and highly respectable class of our people regard the law as especially unfortunate, for the reason that it is not and can not be enforced. It is a prohibition which does not prohibit. This is evinced by the fact above stated, that not far from two hundred saloons have been openly engaged in the retail business of liquor selling during the past year. The violation of law with impunity necessarily begets a spirit of lawlessness, and, to a greater or less degree, offers encouragement to criminals. Public sentiment against the law has been greatly augmented and strengthened by the fact that the Internal Revenue Bureau of the Treasury Department licenses the liquor dealers, while the Department of Justice prosecutes them; thus putting the Government in the attitude of attempting to knock the dealer down with one hand while taking his money with the other. Aside from this,

prosecutions under the prohibitory law have degenerated into a farce. Grand juries indict and petit juries convict with the tacit understanding that a fine shall be imposed, the amount of which is usually known both by the grand and petit jury before indictments are brought or convictions had, thus placing the judiciary, seemingly at least, in the position of bartering with lawbreakers. Blinking the law does not enhance respect for it, and criminal prosecutions, which, under the pretense of enforcing law, tacitly invite its continued violation, are judicial travesties which inevitably breed contempt for courts and their machinery.

The sole extenuation for this sort of thing is the well-known fact that if the maximum punishment for violations of the law—viz, a fine of \$500 or six months' imprisonment—were inflicted, grand juries would no longer indict and prosecutions for violations of the law would be at an end. Another potent factor in exciting hostility and disgust among our people for the present liquor law is the charge, openly made and widely circulated, of the existence of whisky rings here, composed of Government officials, who see that the liquor gets ashore, and "beach combers," who see that it is taken care of after it is landed. Whether the charges are true or not, they are almost unanimously believed by our people, and quite naturally and reasonably are laid at the door of the prohibitory law. Certain it is that without the law neither the charges nor the rings could exist. Remove the prohibitory liquor law and the whisky rings will disappear and the occupation of the smuggler will be gone.

(3) As to proposed legislation. In my judgment prohibition should be abandoned and the energies of the friends of law and order directed toward the passage of such legislation as will reduce the evils attendant upon the liquor traffic to the minimum. A stringent, inflexible, and well-guarded high-license law is one step in the right direction, as can be easily demonstrated by the experience of those States wherein such a law has been enacted. The license should be a high one, and all the restrictions possible and practicable which the experience of other States has found necessary should be placed around the traffic. It is hardly necessary to go into detail, and while I have no doubt that any differences which may exist among our own people as to the provisions of such a law can be reconciled, I have no faith in its passage. Experience has taught us to believe that Congress cares but little for us or our destiny; and, if it did, I do not believe that it has the moral courage to enact such a law in lieu of the present one against the opposition of an undoubtedly sincere but none the less misguided prohibitory sentiment throughout the States.

Very respectfully,

ARTHUR K. DELANEY.

HON. JOHN G. BRADY,
Governor, etc., Sitka, Alaska.

The following is from Rev. H. Beer, rector of Trinity Church, Juneau:

JUNEAU, ALASKA, August 8, 1898.

SIR: In your letter to me, of July 29, you do me the honor to ask my opinion in regard to the present liquor laws governing this district. Your first question is, "Are the present laws satisfactory?" Now, I can only answer for Juneau and Douglas Island, which places I have known intimately since March, 1896, having been a constant resident of Juneau since that date.

In reply, then, to your first question, I would say that the present liquor laws are eminently unsatisfactory.

These laws were made with the purpose of preventing the sale of intoxicants in Alaska, and since they utterly fail to accomplish that purpose, they must be regarded as being undoubtedly unsatisfactory—in fact, a perfect failure. Liquor is sold openly in Juneau and Douglas City, as much so as in any place I have known where license prevailed. Saloons are run with their doors wide open, their signs are exposed, and there is not the slightest attempt at concealment. All this occurs where the law says "prohibition." There can be no question, then, that the present laws or their administration is an utter failure, and the laws unsatisfactory.

Your second question is, "If the laws are unsatisfactory, why is it that they are so?" I reply that they fail to accomplish their purpose of preventing the sale of intoxicants in Alaska, because the people are not in sympathy with the laws. Perhaps nine-tenths of the people of this town and neighborhood do not want prohibition and are determined not to have it. Now, any law to which so large a proportion of the people is opposed must become a dead letter. Even the laws against murder could not be enforced if the people were unanimous against their enforcement. Much less chance, then, is there for the due administration of laws regarding prohibition of the sale of strong drink.

This leads to your third question, in which you ask, "What changes would you propose?" Well, since prohibition has proved itself a failure, and the laws for enforcing it are treated with contempt, I would say let us have high license. In

advocating this measure I am not giving my own opinion only. Ever since I have been a resident of Juneau I have heard all sorts of people say we ought to have high license. I have been told that even some of the more prominent saloon keepers are in favor of that measure, for they say it would crowd out some of the smaller and less reputable dealers, and they say they would prefer to pay license and keep the law rather than break the law as they now do.

The advantages of high license are many. First of all, the chief object had in view in passing the present laws was to prevent the Indians from getting liquor. With high license there would be fewer sellers of whisky, and therefore it ought to be easier to discover those who sold to Indians. Next, since it is evident that the people will not submit to prohibition, we ought to try the next best thing, which is high license. I pass over some of the advantages of this last measure, as, for instance, the revenue derived from such a source and the means it affords of regulating the traffic.

In brief, then, I reply to your questions by saying that the present liquor laws of Alaska utterly fail to accomplish their object of preventing the sale of intoxicants in Alaska, and therefore ought to be changed. The reason these laws fail to accomplish their purpose is that the vast majority of the people are opposed to them; and, thirdly, since it seems evident we must have saloons, it is better to have licensed places, which will perhaps be more orderly and have other advantages over the unlicensed groggery.

With great respect, I have the honor to be, sir, your obedient servant,

HON. JOHN G. BRADY,
Governor of Alaska.

H. BEER,
Rector Trinity Church.

The following is from Rev. J. H. Condit, pastor of the Presbyterian Church of Juneau:

JUNEAU, ALASKA, September 9, 1898.

DEAR SIR: In response to the letter of inquiry regarding our present liquor laws recently sent me, I would respectfully submit the following:

(1) Do you consider the present liquor laws satisfactory? I am satisfied with the laws.

(2) If the laws are unsatisfactory, why is it that they are so? The present unsatisfactory condition arises because of the nonenforcement of the laws, so that practically they are dead letters. Law flagrantly, openly, and persistently violated is a menace to society.

(3) What changes would you propose? The repeal of the present prohibitory law and the substitution of a high-license law.

(4) Will you kindly give your views in full on this subject?

(1) I am and always have been a total abstainer in so far as my personal habits are concerned, and a prohibitionist in so far as the legal restriction of the sale of intoxicants is involved. I believe the former position to be the best for the individual and the latter the best for the state. From the first position I could not deviate and obey my convictions of right. From the latter I would deviate under certain conditions.

I do not belong to that class who refuse a part of a loaf because they may not have it all. If the liquor traffic can not be controlled by prohibitory laws, then I favor controlling it by license laws—high license if possible, low license if that is impossible. Any restrictive measure is better than none.

The question of revenue would not enter into my consideration. It is a question of restriction with me and not of revenue, and hence I favor a high license rather than a low license, and prohibition rather than high license, because the restriction is more rigid if the law is enforced.

Again, I believe that a law virtually unenforced, and hence ignored and demeaned, is more injurious to society than a less rigid law with rigid enforcement. Nothing can be more deplorable, in so far as society is concerned, than the prostitution of law.

(2) There are two reasons why the prohibitory law of Alaska is not effective:

First. Public sentiment does not sustain it. In my opinion it is useless to legislate in advance of public sentiment. The average moral sentiment of the people must under certain obvious limitations determine the legislation of a state or community. The only true method of reform is the reformation of belief. It is impossible to legislate virtue into a man. The most effective means to advanced legislation is painstaking education, and here, as it occurs to me, is the mission of the pulpit.

Second. The Government does not enforce the law. Spasmodic and pyrotechnical seizures of liquor do not offset the fact that breweries are operated and saloons owned and conducted openly in every important town in Alaska.

I do not pretend to place the blame. I do not know whether it is a lack of will or a lack of power which is responsible for the nonenforcement of the law. In any

case I must admit that I feel humiliated that the great Government of the United States does not enforce this legally enacted prohibitory measure.

(3) For these reasons, lack of sustaining public sentiment and failure of Government to enforce the law, I favor the repeal of the present law. It will require time to change public sentiment, and past experience would lead one to believe that the attitude of the Government toward Alaska under existing political conditions will not change.

I believe that the majority of the people of Alaska favor a high-license law, and I believe that such a law would be enforced; and therefore I would welcome a change which would at the same time conserve the majesty of law and restrict a traffic which everywhere and always should be restricted in the best interests of society.

Respectfully, yours,
Governor JOHN G. BRADY,
Sitka, Alaska.

J. H. CONDIT.

Mr. William Duncan is one of the old workers in Alaska. While his views do not agree with the foregoing, his letter is here presented for thoughtful consideration of those who are interested in this subject:

METLAKANTLA, ALASKA, August 30, 1898.

MY DEAR SIR: Your letter of the 28th of July (long delayed somewhere) is to hand asking my opinion in regard to the liquor traffic in Alaska and whether I consider the present prohibitory law satisfactory.

In reply I would say that I regard the liquor traffic as one of the greatest evils in the world, and especially baneful in a country like Alaska, where the officers of the law are located so widely apart, and where the means of communication are so difficult and expensive; hence I regard the present prohibitory law in Alaska as good and salutary, and am only sorry it has not been enforced. The failure to enforce it has naturally suggested the propriety of its abrogation, but that I do not agree with. I do not believe in compromising to an evil, but rather I would fight it to the death. The law should triumph over every obstacle. To license an evil because we find it difficult to stop it is a retrograde policy and fatal to good government.

If magistrates were appointed and permitted to grapple with the illegal traffic unfettered by the jury system, I believe satisfactory results would soon follow.

Yours, very respectfully,

W. DUNCAN.

Hon. JOHN G. BRADY,
Governor of Alaska.

DOUGLAS ISLAND, September 23, 1898.

DEAR SIR: I am duly in receipt of your letter of the 17th. In answer I beg to say that during my residence of nine years in this country I have come in contact with all classes of laborers, miners, mechanics, merchants, etc., and have therefore had ample opportunity to observe the working of the liquor law for this district. In my opinion it is entirely wrong and is entirely against the wishes of the community in general, and I notice that there are a class of men on Douglas Island and in this bay who entirely make their living out of peddling whisky to the natives here, which is a horrible state of affairs. If we had a high license liquor law, say a license of \$1,500 to \$2,000, to be paid by each dealer in liquors, I am satisfied it would in a great measure stamp out these small whisky peddlers who are scoundrels or worse, as they would not be able to pay a high license, and the man that had paid the high license would, in a measure, become a Government detective, and see that none of these small booths sold whisky to Indians or anybody else, and of course no respectable man would sell an Indian whisky. Another thing, with high license enforced in the district here, all of this smuggling of whisky from Fort Simpson, in Canadian territory, would cease, and the Indian between this point, say, and Fort Simpson, in their villages here and there, of which there are many, would not be able to get whisky or go on debauches, as it would not pay the smuggler who now passes the door on his way from Fort Simpson with whisky to sell it to the Indians alone. His revenue would not be enough; therefore, of course the smuggling of whisky being abolished, I claim that the natives of Alaska would be greatly benefited thereby, and in my idea, it is like hunting for a needle in a haystack to try and stop smuggling into Alaska from Fort Simpson. I may also say that for myself, personally, I should as soon see the prohibition laws in the country, but as I said before from my observations here during the last nine years, I think the law is a wrong one for Alaska.

I am, my dear sir, yours, very truly,

ROBT. DUNCAN, Jr.

Hon. JOHN G. BRADY,
Governor of Alaska, Sitka, Alaska.

The following quotations are taken from the reports of the governors of Alaska.

Governor Kinkead said in his report of 1884:

The utmost vigilance of the customs officers can not prevent the importation of liquor. It creeps into the district in every imaginable way. To remedy or at least regulate this traffic I would suggest the appointment of an "executive council," with full power to act in the premises.

In 1885 Governor Swineford said:

If any serious effort has been made to enforce the provisions of section 14 of the organic act, which prohibits the importation, manufacture, and sale of intoxicating liquors, the result of such effort is not discernible in the total or even partial absence of places where such liquors are openly sold. The law in that regard is practically inoperative, and I do not believe that with our extensive coast line the utmost vigilance of the custom officials can prevent liquors from finding their way into the Territory in greater or less quantity. Nothing short of a revenue steamer plying constantly in the waters of southeastern Alaska can effect anything worth mentioning in that direction.

We have here simply a repetition of the workings of prohibition in communities averse to it; but, though positive in the opinion that a stringent license system would be much preferable, I shall nevertheless do all in my power to enforce the law as I find it. The difficulty is that the law being almost universally distasteful there are few if any among the people willing to make complaint under it, nor yet any who will testify if they can avoid doing so. A stringent license law would be much more efficacious and restraining in its operation, and would at the same time produce a very considerable revenue. As it now is, the law has no other effect than to impose very high prices on consumers, thus securing immense profits to those who violate it. Should Congress determine to give Alaska a full Territorial form of government, with power to legislate on all questions of local concern, it will yet be necessary to repeal the section referred to before any local law can be enacted for the regulation of the liquor traffic. I do not hesitate to recommend, in any event, the repeal of section 14 and the enactment of a rigid license clause in lieu of it.

In 1886:

At the May term of the district court a grand jury was impaneled and returned indictments against a number of persons charged with the importation, manufacture, and sale of intoxicating liquors. The indicted parties having combined together, a test case was agreed upon, to be tried and determined at the next succeeding regular term. In this case the defendant filed a demurrer to the indictment, alleging, among other things, that the statute claimed to have been violated "is unconstitutional and void." When the case was called for hearing at the September term the court overruled the demurrer and the defendant was convicted and sentenced, whereupon the case was taken on writ of error to the circuit court for the district of Oregon, and there the matter rests for the present. In the meantime there is apparently no diminution in the quantity of liquors which is being smuggled into the Territory, nor in the number of places where it is openly sold. Indeed, it is questionable, even with the assistance of a revenue cutter constantly plying in the almost interminable inland waters of southeastern Alaska, whether the illegal traffic can be more than partially destroyed. That it can, however, by such means be made a much more hazardous, and consequently less lucrative, business to those engaging in it is not to be denied; but in my opinion the law ought to be repealed. Stringent regulation would be much better than prohibition which does not prohibit, or which can at most be made only partially effective, and that at great cost to the Government. There is no valid reason why the law in this regard should not be the same in Alaska as in the other Territories. The statutes prohibit, under severe penalties, the sale of intoxicating liquors to Indians everywhere, but in no other Territory than Alaska is the prohibition made to include white and civilized people.

There is less to be feared from the adoption of a license system here, so far as the natives are concerned, than in any other Territory. The dealers who are now pursuing an illegal calling are very seldom known to sell to the Indians, among whom drunkenness would be of rare occurrence but for the fact that they manufacture their own intoxicants from staple commodities, the sale of which is not, and can not, in the nature of things be prohibited. The Indian population of New Mexico, Arizona, Idaho, and Washington are far less intelligent, though more fierce and warlike, than those of Alaska, and yet Congress has not deemed it necessary to wholly prohibit the importation and sale of intoxicating liquors in these Territories. The only effect of the law as it now stands has been to flood the Territory with liquors,

the most vile and poisonous, to the enrichment of the few who have been engaged in their illegal importation. A stringent license law would not only yield a revenue sufficient to cover a large part of the expenses of the civil government, but would be the most effective means that can be devised to restrict the traffic.

In 1888:

Section 14 of the act of May 17, 1884, prohibits the importation, manufacture, and sale of intoxicating liquors in Alaska, except for medicinal, mechanical, and scientific purposes. I regret being compelled to say that this law is practically a dead letter. The public sentiment of the Territory is averse to it, and unless the right of trial by jury is taken away it can not be enforced, for the simple reason that it is impossible to impanel a grand jury which will indict, or a petit jury which will convict, persons charged with its violation. But were this not true, the officials charged with the duty of preventing the importation and landing of intoxicating liquors are practically powerless in the premises, for the reason that they have never been provided with any means whatever which will enable them to watch and guard any part of the extensive coast line, save immediately at the few ports where they are stationed.

There is no water patrol, no revenue cutter, no transportation, not even a row boat, under their control, and as a consequence the smuggler pursues his nefarious calling with very little molestation from any quarter. The innumerable bays and coves along the coast of southeastern Alaska, with its network of deep and narrow channels, afford as many hiding places to small vessels, and I am in doubt as to whether a revenue cutter, permanently stationed in these waters, would be able to wholly break up the illicit traffic in intoxicating liquors and dutiable goods. Nothing, in my opinion, will effectually serve the purpose save a well-organized water patrol, acting in conjunction with a vessel of the revenue marine, both of which would necessarily have to be kept on duty the whole year round. In view of the large expense this would involve, and the improbability of any such recommendation being favorably acted upon, I do not hesitate to again respectfully recommend the repeal of the clause prohibiting the importation and sale of intoxicating liquors, and the enactment in its stead of a stringent license law. This recommendation is prompted by an earnest desire to bring the traffic under effectual regulation and control, and is not made because, in my opinion, prohibition would not be better, could it be enforced. In the case of Alaska, prohibition does not prohibit; it simply means free whisky, in the sense that it is openly sold with the approval of a public sentiment, from which juries to convict offenders can not be drawn. A stringent license law would enable the courts to close up more than half the so-called saloons, and would put an end to the whisky smugglers' vocation, by taking away the enormous profits which the law offers as an inducement to its own violation.

Governor Knapp said in 1890:

The law prohibiting the sale and manufacture of intoxicating liquors in the Territory is a dead letter, except in its application to the Indians. Liquors of the vilest quality, it is asserted, are sold openly and in violation of the law, even to those whose families are suffering for the necessities of life. The reason assigned for the inefficiency of the law is that prosecutions would be of no avail. Grand juries refuse to indict, and petit juries refuse to convict. I presume this statement is made intelligently and is in accordance with the facts, though I am not aware of any attempt to secure convictions. A number of complaints to the grand jury at the January term for smuggling liquor, resisting an officer, etc., were treated by that body in a way to induce the belief that they were not in sympathy with restriction laws.

In 1891:

Of the criminal business a large proportion was either directly connected with the sale and importation of intoxicating liquor or grew out of its use directly or indirectly. The unfortunate conditions of nonenforcement of the laws on these subjects reported last year are still continued, and the results of efforts to enforce them are no less unfortunate.

In 1892:

It has been alleged, in excuse for neglect to prosecute offenders against the prohibitory law of Alaska, that public sentiment will not sustain prosecutions; that convictions can not be secured however strong the proof; that grand juries will not indict any man for selling intoxicating liquor to white men.

I am not prepared to dispute these allegations, and yet I do not like to believe that there are no honest men in Alaska who have regard for their oaths. If an honest and vigorous effort were made, if prosecutions were brought and pushed to issue with the thoroughness which ought to characterize the actions of men intrusted

with the responsibilities of office, then failure might prove the existence of such an unfortunate lack of integrity on the part of the citizens of the Territory as is implied in the allegations above cited.

It is true grand juries act secretly, and it would scarcely be becoming in me to assume to give an account of their deliberations or their undisclosed acts. It will be seen from the above court statistics, however, since commissioners' courts have no grand juries, that out of the 63 trials for selling intoxicating liquor reported, 62 were commenced by information or complaint, and no grand jury had any hand in the business whatever. Besides, a district attorney ought to carry his sense of responsibility for the enforcement of the criminal laws of his district into the grand-jury room. Can a man of ability and vigorous personality have no influence to prevent injustice and crime and criminal neglect and disregard of official obligation because of the veil of secrecy over the discussions in that body?

In a letter published in the report of the governor of Alaska for the fiscal year 1891, Appendix B, the district attorney says:

"There are also many persons openly engaged in selling intoxicating liquors contrary to law. These facts I have laid before each grand jury, advising them that it was their sworn duty to indict all such persons. Yet in every instance they not only refused to indict, but have refused to hear any testimony upon the subject whatever."

This is a serious indictment. The men composing these grand juries were sworn officers of the court. Failure to bring an indictment when proper proofs were presented was perjury. Refusal to receive testimony may be contempt of court, and is at least an exhibition of unfitness to serve in the important and responsible office of juror. If the allegation is well founded, it discloses a condition of things which requires heroic treatment. It is difficult to see how, under such circumstances, a district attorney can do less than report the facts in open court, so that the judge can judicially determine whether or not the conduct of the jurors is worthy of censure or punishment, and whether there is such a disregard of their sworn obligations as to unfit them for further service in the capacity of officers of the court. It would seem that self-respect, as well as official obligation, demands that much.

Governor Sheakley said in 1893:

The law prohibiting the importation, manufacture, or sale of intoxicating liquors in Alaska is (in its present construction) a source of irritation and discontent among all classes of people in the Territory. It gives rise to a large traffic in smuggled liquors, mostly from British Columbia, which our customs officers can not prevent and have not the means to suppress. Either the law should be changed or the revenue officers provided with the means to enforce its provisions.

Under the regulations made by the President and promulgated in Treasury Circular No. 34, dated March 12, 1892, the governor of the Territory may grant permits to sell intoxicating liquors for medical, mechanical, and scientific purposes. He may also revoke these permits for any violations of the regulations under which they were granted.

In 1894:

I believe all the gentlemen who have held the position of collector of customs in Alaska, with whom I have become acquainted during the past seven years, have endeavored to earnestly and honestly perform their duty with respect to this law, and I know that no one has made greater efforts to enforce its provisions than the present incumbent.

Notwithstanding the efforts of the collector of customs, his deputies, and all the other civil officers in the Territory, intoxicating liquors are imported, landed, and sold without stint in every white settlement in Alaska.

Congress appears to have been content with passing a prohibitory law for the district of Alaska without providing any of the auxiliaries necessary and indispensable for the execution and enforcement of the same. There are no roads in Alaska, and all travel and transportation of merchandise must be by water navigation.

Alaska has 4,000 miles of seacoast and 20,000 miles of shore line to be watched and guarded against the smugglers of intoxicating liquors and contraband goods. As yet the customs officers have not been supplied with any kind of transport with which they could pursue, seize, and search vessels engaged in the illicit traffic.

Within the past year the collector of customs for Alaska has seized and forfeited 776 gallons of whisky and brandy, 462 bottles of whisky, and 17 pounds of opium, smuggled goods.

The United States district attorney for the district of Alaska is charged with the duty of prosecuting all persons accused of violating provisions of section 14 of the organic act, which prohibits the importation, manufacturing, and sale of intoxicating liquors in said district. The law makes no distinction as to whether the vendee be an Indian or a white man, but public sentiment is so unanimously against the

practice of selling or giving liquor to Indians that none but the lowest outcast will be found in the business.

Grand juries do not fail to find true bills of indictment, petit juries do not hesitate to try and to convict, and the court does not delay in passing sentence upon anyone found guilty of this crime. But when white men are accused of selling intoxicating liquors to white men the case is entirely different, so far as juries are concerned. Public sentiment is almost unanimously the other way.

The organic act has been the law of the Territory since May 17, 1884, and a great number of persons have been accused, arrested, and prosecuted by the successive district attorneys at almost every term of the United States district court held in Alaska. Yet in opposition to the repeated and forcible charges of the judge of the United States district court, and his earnest efforts to enforce the law, the grand juries have neglected to find bills of indictment against the offenders, and the records of the court fail to show that anyone at any time has been indicted, tried, or convicted of the crime of selling intoxicating liquors to white men.

The district attorney reports that 33 persons are under bonds to appear before the United States district court at Juneau, Alaska, in November next, for selling liquor in violation of the special internal-revenue law; 37 persons for importing and selling liquor contrary to section 1955 of the Revised Statutes of the United States, and 20 persons for all other offenses.

In 1895:

The importation, manufacture, and sale of intoxicating liquors in the Territory of Alaska is prohibited by the laws of the United States. The enforcement of these laws has proven to be a difficult matter. When anyone has been charged with the offense of selling intoxicating liquors to white men, or of manufacturing malt beer, the grand juries have uniformly refused or neglected to find a true bill of indictment, and the offender goes without punishment. Both the venders of intoxicating liquors and the manufacturers of malt beer, when arrested for violating the law, set up the defense that their business is a lawful one, and that it is carried on with the sanction of the Government, and in proof of this they will offer in evidence Government receipts issued by the Commissioner of Internal Revenue, or his deputies, for money paid into the Treasury of the United States.

This special internal-revenue receipt confers no right or privilege or license to import, manufacture, buy, or sell intoxicating liquors in Alaska in contravention to the local law or the law of Congress, as applied to Alaska, prohibiting the same. The grand juries have taken the position that Alaska has no local law, and that any law of Congress is equal to any other law enacted by the same authority, and that when anyone has complied with the requirements of the internal revenue law he is not subject to indictment for violations of the prohibiting act, and this appears to be in accord with the sentiment of the people, a large majority of whom are not in sympathy with the prohibitory laws.

The collector of customs for the district of Alaska has been faithful and vigilant in the discharge of his official duties in trying to suppress the smuggling of intoxicating liquors into this Territory and has used all the means under his control for that purpose. A United States revenue cutter has been cruising in the waters of southeastern Alaska during part of this summer on the lookout for the small craft by which the smuggling business is carried on. Notwithstanding the efforts of the collector of customs, his deputies, and the presence of a United States cutter, this illicit traffic appears to suffer no abatement.

At almost every term of the United States court held in the Territory since the inauguration of the civil government, eleven years ago, there have been a number of persons held under bonds to appear and answer to the charge of selling intoxicating liquor in the Territory of Alaska in violation of the statutes of the United States made and provided.

Up to the present hour not one of all the accused has ever been indicted, tried, or convicted of that offense when the vendee was a white man. The liquor traffic in Alaska, carried on as it is in violation of existing law, has a demoralizing effect upon the people, both white and native. It begets a disregard of all law, and has fostered smuggling and the clandestine importation of intoxicating liquors into the Territory until the illicit traffic has become so well organized that it is almost impossible of detection.

Some laws should be enacted by Congress by which the business of importing, manufacturing, and selling intoxicating liquors in Alaska should be restricted, regulated, or controlled, and the traffic in smuggled goods and liquors forever destroyed.

On the 1st of July, 1894, the collector of the internal revenue, after a suspension of about one year, resumed the issuance of special-tax stamps to all persons engaged in the liquor traffic in Alaska. Since that time 34 liquor dealers and 4 brewers have paid the special tax of \$25 each and received their receipts from the collector of internal revenue.

For a period of one year from the 1st of July, 1893, no special internal-revenue tax was collected from or receipts issued to the liquor dealers or breweries in Alaska, except to those who had a permit from the governor to sell liquors for medicinal, mechanical, and scientific purposes. Several liquor dealers, not wishing to incur the penalties of the law relating to the collection of the internal revenue, retired from the business, and the breweries suspended operations. During this period there was a marked decrease in the amount of intoxicants consumed.

The special revenue-tax stamp confers no right, power, privilege, or license to import, manufacture, buy, or sell intoxicating liquors in Alaska in contravention to the local law. The law so declares, the receipt so reads, and all the higher courts have so decided. It is well understood that this stamp is not a license to sell intoxicants, yet when a person accused of that crime produces in court this evidence of his having paid a tax into the Treasury of the United States as a liquor dealer in Alaska it stultifies the case exceedingly.

The law prohibiting the importation, manufacture, and sale of intoxicating liquors in Alaska should be amended in such a manner as to enlist at least a portion of the people of Alaska in support of the court and the civil officers in their efforts to enforce its provisions.

In 1896:

The importation, manufacture, and sale of intoxicating liquors in the district of Alaska, except for medicinal, mechanical, and scientific purposes, is prohibited by law. In theory, Alaska is a prohibition country. In practice, it is not. Notwithstanding the unceasing efforts of all the civil officials, liquor can be obtained in any white settlement of any consequence in the district. And when it is remembered that not even a single business man here is in favor of the enforcement of this law, this condition of affairs is easily understood. The extensive coast line of Alaska, with its innumerable bays, together with the sentiment of its residents, makes smuggling easy, and load after load of liquor is brought from British Columbia to the different Alaskan towns.

The collector of customs and his deputies and assistants do all they can to prevent this illegal traffic, as is evidenced by the amount of liquor which has been seized during the past year. But his force is wholly inadequate to cover the ground, and he is practically without transportation facilities. Once landed, the liquor is hidden in some secure place, to be taken therefrom and disposed of to the retailer as necessity requires. And the retailer also has his private hiding place, and seldom has more than a bottle or so of liquor in his saloon at one time; so if he is raided his loss amounts to practically nothing.

For many years the grand jury here refused to indict saloon keepers, or even to allow evidence to be presented of violations of the prohibitory law. This, however, only applied to sales to white men. The grand juries of Alaska have never failed to indict, nor petit juries to convict, anyone proven guilty of selling whisky to Indians, or of selling intoxicating liquor without first having paid the United States internal-revenue tax.

The people of this district take the stand that Congress in passing this prohibitory law had in mind the Indians, understood their condition, and knew that it was necessary for their well being to keep liquor from them; that when it was passed the white population in Alaska was small and not taken into consideration; that since its passage the population has largely increased and new conditions arisen, and that in vigorously enforcing the liquor law in regard to the Indians, and practically ignoring it in regard to the whites, they are carrying out the spirit of the law and fulfilling the intent of its makers. The civil officials, however, must take the law as they find it, and have strenuously endeavored to enforce it. Their efforts have been practically fruitless, as is shown in previous reports.

At the last November term of our district court the grand jury indicted all the saloon keepers in the district. They thought it better to plead guilty than to employ attorneys and fight the indictments in court. They pleaded guilty and each of them was fined \$50. At the last March term of the district court the grand jury again brought in indictments against all the saloon keepers in the district. Thereupon one of their number entered a plea of guilty and the court imposed a fine of \$500 upon him. The rest immediately combined together, employed many of the attorneys in the district, and prepared to fight the indictments. Demurrers were interposed, but after argument they were overruled by the court and the indictments held good. United States District Attorney Bennett thereupon moved one of his best cases for trial and presented his evidence, and the case was submitted to the jury, which promptly returned a verdict of not guilty. The district attorney moved another case and again presented the evidence.

The defense, as before, offered no evidence at all. This time the jury failed to agree. In each of the cases several days were consumed in securing a jury, and it was with difficulty that in the second case one was secured at all.

The district attorney, feeling that it would be impossible to secure another jury at this term of court, to say nothing about securing a conviction at this time or the expense that would be incurred in proceeding further, and evidently thinking it best to rest on a disagreement rather than absolute acquittals, asked the court to continue the remaining cases over to the coming fall term of court, and that each defendant be placed under \$500 bonds during that period. This was accordingly done. Indictments are now pending against 45 saloon keepers, located at Juneau City, Douglas Island, Sitka, and Fort Wrangel. That all of these defendants have sold liquor in violation of the existing prohibitory law is a matter of common notoriety. That one of them will be convicted by a trial jury is, I am sorry to say, not believed for a moment by any resident of Alaska.

The present district attorney has shown commendable zeal in his endeavors to enforce the law, believing that all laws should be enforced until repealed.

It must not be inferred from the way juries stand in regard to this class of cases that Alaska is in any sense of the word a lawless community. The courts here stand as high and are as able as in any part of the United States, and crime is as surely punished here as elsewhere. Our juries are not composed of saloon keepers, but of miners and business men. The miner can always be relied upon to mete out equal and exact justice to all. Hard working, large hearted, and just, it is a libel of the basest kind to call him lawless or the community in which he lives a lawless one, and I am glad to bear witness that it is only malicious and irresponsible persons who do so.

As the matter now stands, as I said in my last annual report, this prohibitory liquor law is most demoralizing in its effect. It begets a disregard for all law, fosters smuggling, and causes a large class of citizens who ought to aid the civil authorities to be against them, and crimes that ought to be punished, and would be were it not for this law, go unpunished. Being against the Government in this matter, they are, almost unknowingly, in others, and a desire to get even often outweighs all other considerations. Meanwhile the sale of liquor goes on openly, and none of the people in the district seem to be opposed to it. Prohibition, unless supported by a large body of the citizens of a community, means here, as it means everywhere else, "free whisky." Laws to be enforced must be just and reasonable, and must have the support of the people, and even though, as in this district of Alaska, they have no say in their making, in the end they have all to say when they, as jurors in the jury box, are called upon to pass upon their violators. The present law should be repealed and in its place a high-license law, with proper safeguards, be enacted. The good effects would be immediately apparent. The saloons would decrease, smuggling would cease, sales of liquor to Indians would be lessened (for every saloon and liquor man would be with the Government to suppress it), vile compounds and death-dealing mixtures would necessarily disappear, and the General Government would be benefited by collecting its proper revenue, which is now lost.

Congress has undertaken to govern two districts, the District of Columbia and the District of Alaska, on totally different principles—the former the seat of Government itself, with an abundance of force to carry out every regulation, where public opinion is quick and sensitive and finds expression in the daily papers, and where the liquor traffic is allowed and regulated by two sections of the United States statutes, and where such law is found to work well and give order to society; and the latter, 4,000 miles from the seat of Government, an immense territory in itself, with a very meager executive force, handicapped in every way, especially for the means of transportation, where the population is sparse and scattered, and where the executive department of the Government is called upon to execute another section of the Revised Statutes, which is a stringent prohibitory law.

It is hoped that our lawmakers will keep in mind this contrast between the two United States Districts.

Records of the district court will show that many of the worst crimes committed have been in connection with this illegal traffic.

If Congress therefore wishes to reduce the number of criminal cases upon the dockets of the court, if it wishes to have a law upon its statute books that will receive the approbation of the majority of the citizens in this district, if it wishes to obtain revenue ample enough to bear

nearly all of the expenses incurred in governing Alaska, it can do so by simply extending and making applicable to Alaska the laws which are now on the statute books for the District of Columbia, which were enacted in 1893 and 1894; providing, however, that no license shall be less than \$1,000 and more than \$2,000, and it might further be provided that the governor, United States marshal, and district attorney be constituted an excise board to enforce all provisions of these laws. Such an act would be pleasing and acceptable to the people. Nothing has disturbed the peace and good order of the Territory so much as this liquor-traffic question. It is earnestly hoped and believed that Congress will give serious attention early at its next session to this subject.

CRIMINAL AND PENAL LAWS.

The commission to revise and codify the criminal and penal laws of the United States have reported to the Attorney-General the result of their labors in behalf of Alaska. The criminal and penal laws which they have compiled out of the Revised Statutes of the United States and from the code of Oregon, together with a code of criminal procedure, have been examined with care by members of the Alaska bar and by officers of the court, and all consider the work satisfactory under the circumstances. This work was approved by the Senate, but when the chairman on the revision of laws brought it up in the House there was dilatory action, and it failed to pass. It is hoped that the House will view more favorably this work and act upon it early in the coming session. Lawyers here speak in appreciative terms of this work, and the people of Alaska feel grateful to the commission for its labor.

This same commission, by a concurrent resolution of Congress which passed the House May 31 last, was "directed to prepare and through the Attorney-General submit to Congress at the earliest practicable date a code of civil procedure for the district of Alaska." This work no doubt will be ready for the consideration of Congress at its coming session, and it is believed that it will be as well done as such a task can be under the circumstances, for the commission realize the helplessness of Alaska.

LAND LAWS.

There is not nor has there been any difficulty since the passage of the organic act about mineral lands, for the reason that the laws of the United States relating to mining claims and the rights incident thereto were declared to be in full force and effect in the district.

The closing sentence of section 8 of the same act is:

But nothing contained in this act shall be construed to put in force in said district the general land laws of the United States.

Why such a distinction was made is past comprehension. Men may have the right to dig out ore upon lands and may obtain patents for the same, but if they dig out a cellar and build a house and improve lands for a home they can not obtain a title.

This state of affairs has been brought to the attention of Congress in almost every report which has been written by a Government officer. This has been the status now for thirty two years. It is true that Congress passed a law March 3, 1891, that a citizen, association, or corporation, for the purpose of trade or manufacture, may purchase not exceeding 160 acres. A number of persons made application to purchase land under this act at \$2.50 per acre; they made their deposits in national depositories and received triplicate receipts. Surveys

were ordered, but when they were sent in for approval many objections were raised and but few were allowed.

In one case, where the survey had been approved, where final proof had been made, the land paid for under the regulations of the Department, the receipts of the register and receiver issued to the applicant, and all the papers forwarded to the General Land Office for a patent to issue, the applicant was informed that 20 acres only would be allowed, because his improvements did not appear to cover more, and upon appealing to the Secretary it was allowed that his improvements might cover 50 acres, and that if he accepted this he must have it surveyed again at his own expense and pay \$2.50 per acre besides—that there is no provision of law to pay back to him the money which he paid to the receivers, whose receipt he holds.

The Land Office has issued one patent only under the law of March 3, 1891, for trade and manufacture.

It does not rest with the applicant how much land he may take, whether the maximum allowed by the act or a less amount, but with the officer of the Land Office.

Seven years have passed and the law as interpreted has only been a hindrance and a costly thing to those who have attempted to acquire rights under its provisions.

The act of Congress approved May 14, 1898, makes a feeble attempt to extend homestead rights to Alaska. It provides:

SEC. 1. That the homestead land laws of the United States and the rights incident thereto, including the right to enter surveyed or unsurveyed lands under provisions of law relating to the acquisition of title through soldiers' additional homestead rights, are hereby extended to the district of Alaska, subject to such regulations as may be made by the Secretary of the Interior; and no indemnity, deficiency, or lieu lands pertaining to any land grant whatsoever originating outside of said district of Alaska shall be located within or taken from lands in said district: *Provided*, That no entry shall be allowed extending more than eighty rods along the shore of any navigable water, and along such shore a space of at least eighty rods shall be reserved from entry between all such claims, and that nothing herein contained shall be so construed as to authorize entries to be made or title to be acquired, to the shore of any navigable waters within said district: *And it is further provided*, That no homestead shall exceed eighty acres in extent.

If anyone wants to know how valueless this law is to the settler, let him read the analysis of the law in a circular from the General Land Office issued June 8, 1898.

There are no surveyed lands in Alaska nor has any system of survey been provided. It is impossible, therefore, for a poor settler to acquire a homestead. If he were able and willing to stand the expense of a survey, he has no assurance that it would be accepted by the Government. If he settles as a squatter and makes improvements, he can not tell how future surveys may affect him.

Not a single homesteader has attempted to make entry under this law in the land office at Sitka. The gentlemen who framed this law and had most to do in urging its passage will no doubt be surprised at this statement, for they feel kindly disposed toward Alaska and thought they were serving her a good turn by putting through such a liberal enactment. It is a good illustration to show how difficult it is for men to legislate for a country which they have never seen and whose conditions they do not understand.

Under the heat of the debate on this measure one Member, in his effort to fortify it, waxed warm and exclaimed:

Gentlemen, men are not going to flock into Alaska for the purpose of taking homes. Men would not want to take homes where they would in many instances have to take dynamite in order to blow off the ice to reach the ground. [Laughter.] There are countries near by vastly superior for such purposes. [Applause.]

He was right; there has not been much flocking in. The law does not encourage it. Under the provision of this act relating to the acquisition of title through soldiers' additional homestead rights, four entries have been made. One of these is by a retired deep-sea captain beyond the age of 76 years. He has settled about a mile and a half, on a rocky part of the beach, north of Sitka, where he can see the breakers and hear their roar as he lies in his cabin. For some time he has been anxious to acquire title to this spot. He has done so with soldiers' scrip for 6.1 acres. This has cost him in office fees and attorney's fee and the price of the scrip \$250, with the price of the survey yet to be added.

Now, this land is not valuable by unearned increment, nor for mineral, nor for garden purpose, except at a great expense and infinite labor. This is by a citizen of the United States in an effort to obtain title to a spot of earth which has cost his Government less than 2 cents per acre.

A number of filings were made at once under the provisions of the act for right of way for railroads, wagon roads, and wire rope tramways.

It remains to be seen how willing men are as individuals, associations, and corporations to begin, complete, and carry on such conveniences for the public.

Section 13 of this same act has fallen stillborn, but remains as a kind of felicitation toward native-born Canadians on the part of our lawmakers for the great courtesy which our citizens have received at their hands in the Klondike.

Section 11 of this law places the disposal of timber upon the public lands in the district of Alaska wholly in the hands of the Secretary of the Interior. Through the General Land Office he has issued rules and regulations for the cutting and removal of timber. These are not at all practicable now, but, no doubt, they will be made so when the inspectors in the field have had opportunity to confer with the people and gather up the facts and report the same to the Department.

Nearly all the timber and lumber which has been used in the building of Dyce, Skagway, and the railroad there, in the erection of the mills upon Douglas Island, and at other points, has been shipped from Puget Sound.

The needs of the Northwest Territory were urgent and the Continental Congress was pressed to take action, which it did on July 13, 1787, just about two months before they engrossed the Constitution and signed it. The conditions which confronted those thoughtful and earnest men in regard to that vast and almost unknown country were as serious as will be those which the present Congress will be called upon to face, when they come to consider Alaska, Hawaii, Cuba, Porto Rico, and the rest.

This ordinance of 1787 is commended to those who are thoughtfully pondering over these great problems. It can be found in the Revised Statutes of the United States, page 13.

The sagacity of those remarkable statesmen shines out in section 5:

The governor and judges, or a majority of them, shall adopt and publish in the district such laws of the original States, criminal and civil, as may be necessary, and best suited to the circumstances of the district and report them to Congress from time to time, which laws shall be in force in the district until the organization of the general assembly therein unless disapproved of by Congress; but afterwards the legislature shall have authority to alter them as they shall think fit.

They knew the temper and spirit of the people who were migrating out West. And how generously they trusted them!

Does anyone believe that, if Congress in 1884 had inserted such a section into the organic act for Alaska, matters would have gone on in such an uncertain slipshod manner as they have for fourteen years? What is there instead? Let section 7, of the organic act, answer. Here it is:

That the general laws of the State of Oregon now in force are hereby declared to be the law of said district so far as the same may be applicable and not in conflict with the provisions of this act or the laws of the United States.

It should be understood that any law passed in Oregon since 1884 is not applicable, also that eight different men have sat upon the bench as district judges, and hardly any two of them have held the same opinion as to the applicability of the law, which may be invoked by litigants. Men have been tried for murder and other felonies and sentenced to the penitentiary for life and for terms of years, and yet it is the opinion of able lawyers, some of them in Congress, too, that there never has been a lawful jury in Alaska.

It is hoped that the Members of Congress to whom these matters may be intrusted in the approaching session may give this matter the serious consideration which the circumstances demand.

The following is the list of those who have been appointed to office, and who are here endeavoring to execute the law:

Name.	Position.	Official residence.	Where appointed from.
John G. Brady	Governor	Sitka	Alaska.
C. S. Johnson	Judge	do	Do.
Robert A. Friedrich	United States attorney	do	California.
Alfred J. Daly	Assistant United States attorney	Juneau	Alaska.
Albert D. Elliot	District clerk	Sitka	Washington, D. C.
Joseph J. Rogers	Deputy clerk	do	
J. M. Shoup	United States marshal	do	Idaho.
C. W. Tuttle	Commissioner	do	Indiana.
Norman E. Malcolm	do	Juneau	California.
K. M. Jackson	do	Fort Wrangell	Texas.
L. R. Woodward	do	Unalaska	California.
Philip Gallager	do	Kodiak	Washington.
C. E. Schluere	do	Dyea	Oregon.
W. J. Jones	do	Circle City	Washington.
Chas. H. Isham	do	Unga	Maryland.
Lennox B. Shepherd	do	St. Michaels	Illinois.
W. H. McNair	Deputy marshal	Sitka	Alaska.
W. S. Staley	do	Juneau	California.
James C. Blaine	do	Unalaska	Alaska.
Edward C. Hasey	do	Kodiak	Idaho.
Lewis L. Bowers	do	Unga	Washington.
F. M. Canton	do	Circle City	Alaska.
Wm. D. Grant	do	Wrangell	Do.
Cornelius L. Vawter	do	St. Michaels	Montana.
Judas M. Tanner	do	Dyea	Alaska.
W. L. Distin	Surveyor-general	Sitka	Illinois.
John W. Dudley	Register	do	Washington, D. C.
Esauwell Shelley	Receiver	do	Oregon.
Jos. W. Ivey	Collector	do	Do.
W. P. McBride	Deputy collector	do	Idaho.
E. T. Hatch	do	St. Michaels	Oregon.
Chas. Smith	do	Circle City	Do.
A. M. Guild	do	Karluk	Washington.
W. M. Wheeler	do	Cooks Inlet	Do.
J. F. Sinnott	do	Unga	Oregon.
John Goodell	do	Orca	
John M. Tenney	do	Juneau	Washington.
W. G. Thomas	do	Kodiak	Alaska.
Wm. Gauntlett	do	Unalaska	Washington.
E. M. Van Slyck	do	Mary Island	Oregon.
Wm. Zimmer	do	Chilkoot Pass	Illinois.
Frank M. Richards	do	Stikine Boundary	Washington.
J. N. Wheeler	do	White Pass Boundary	Oregon.
J. A. Arment	do	Wrangell	Do.
Jos. E. Floyd	do	Skagway	Do.
John R. Beagle	do	Dyea	Do.
W. D. McNair	do	Sitka	Alaska.

Name.	Position.	Official residence.	Where appointed from.
Chas. I. Roth	Deputy collector	Circle City	Washington.
J. I. Rutledge	Inspector	Douglas City	Oregon.
E. A. Hamilton	do.	Juneau	Do.
T. F. Payne	do.	Dyea	Do.
O. J. Laird	do.	Skagway	Do.
S. L. Adams	do.	Wrangell	Do.
Geo. J. Smith	do.	do.	Do.
E. L. Hunter	do.	do.	Do.
Harry P. Minto	do.	Juneau	Do.
Wm. J. Culver	do.	do.	Do.
Fred. S. Williams	do.	Skagway	Do.
Wm. Denny	do.	Dyea	Do.
Loring K. Adams	do.	Skagway	Do.

POPULATION.

There are very few accurate statistics concerning affairs in Alaska, and it is a matter of probabilities when it comes to giving the population. The Russian Greek Church keeps an accurate register of births, deaths, and marriages and removals in each parish. In 14 of these there is an enumeration of 15,064. This includes a small number of whites; the great majority are creoles and natives. Sixteen thousand would be a safe estimate for the number of natives in the different parts of the district who are not on the books of the Russian Church. Many thousands have gone over the passes, and a large number during the summer have ascended the Yukon, most of them bound for Dawson, the Klondike, and its tributaries. Probably 3,200 attempted to prospect the Copper River basin. Several hundred entered at Yakutat. Quite a crowd went to Kotzebue Sound. It has been a year of movement and stir and push, and a right royal class of men most of them are. The majority are picked men from the States. The rules and regulations and the manner of enforcing them have offended a great many people, and this has driven many across the boundary to prospect in Alaska.

The white population last year was estimated at 10,000. It would be a conservative estimate to-day to reckon it at 19,000. We would then have—

Natives and Russian creoles	31, 064
Whites	19, 000
Total	50, 064

TAXABLE PROPERTY.

A very considerable amount of money is invested in salmon canneries and in machinery, buildings, and other improvements for mining. Merchants in the outfitting and supply business carry large stocks. Taxation just now would bring a burden upon many new enterprises which they could not stand. It would be well to defer any system of taxation until the land laws are properly extended so that people may have encouragement to improve and cultivate them and to build houses, which shall be comfortable and permanent homes. Alaska should and can pay revenue into the United States Treasury.

Under a high-license system, as above outlined, not less than \$200,000 annually would be turned in.

A few cents a case on salmon would produce from \$35,000 to \$50,000.

Ten cents a ton out of the wharfages collected would have brought in this past year \$100,000.

These three items, together with a very few others, would produce a revenue of about \$400,000, and this at a very trifling cost for collection. It is hoped that these few lines may catch the attention of the Ways and Means and the Appropriation committees.

AGRICULTURAL DEVELOPMENT.

The dealers in seeds upon Puget Sound, at Portland, Oreg., and at other places sold large quantities to prospectors last spring. It is too soon to learn much about results from these scattered efforts at planting. Many vegetables on the beach at Valdes, in Prince William Sound, did well under most unfavorable circumstances. Last year the Agricultural Department had two agents making inquiries, and this year it has continued its investigations. In the neighborhood of Sitka, barley, oats, flax, red and white clover planted the last week in May all came to maturity, developing perfect seeds before the first frost in the last part of September. Sage, thyme, carrots, beets, peas, turnips, potatoes, cabbage, cauliflower, lettuce, radish, parsnips, and oyster plant were planted and have made a fine showing for the amount of attention given to their cultivation.

There are many varieties of native berries, such as black and red currants, salmon berries, cranberries, blue and red huckleberries. The gooseberry and red raspberry do well under cultivation.

But grass beyond everything else promises to be the agricultural wealth of Alaska. This is but little appreciated at present. The native grasses are nutritious and grow luxuriantly. Timothy, clover, alfalfa, and other cultivated varieties do well. One acre of ground in grass in Alaska for pasturage is worth several acres in a drier climate.

There is no timber west of the eastern part of Kadiak Island. All of the islands and the shore line of the Alaska Peninsula are covered with a heavy growth of grass. The Kenai Peninsula has large areas where the grass grows to a man's armpits. The explorers of the various arms of the Copper River—and these have gone almost to the head of White River—report extensive tracts of grass lands.

The following is the opinion of Prof. O. C. Georgeson, special agent of the Department of Agriculture of the Alaskan Experimental Station:

I arrived in Sitka about the middle of May, and the vegetables and small grains which I have tested were not seeded until the latter part of the month. I can say that in a general way all the hardy vegetables grow with marked success. Pease of nearly a dozen varieties all do well, and the vines grew in some cases larger than they do in warmer regions. Canadian field pease, sown broadcast, grew to a length of 10 to 12 feet, and all varieties matured seed from the pods which were first developed. Turnips, radishes, lettuce, carrots, parsnips, parsley, salsify, beets, mangel, and sugar beets all grew remarkably well, and some of them much better than in the States. Even wax beans produced a light crop of pods, and at Skagway I saw cucumbers 6 inches long grown there. Here at Sitka I did not plant either melons or cucumbers, and it is doubtful if melons would fruit here. But green cucumbers large enough for table use I feel sure can be grown here, if the plants are started in boxes either in a hot bed or in the house.

I have found from personal investigation that all the hardier vegetables can be grown everywhere in the coast region of Alaska. Potatoes grow here in some cases to great size, and where the soil is well drained they are as good in quality as I have ever seen them anywhere. Cabbages, kale, and cauliflower attain almost gigantic size where the soil is of the proper consistency and fertility, and in like manner rhubarb, asparagus, celery, and onions do well in suitable soils.

As for fruit bushes, such as gooseberries, currants, both red and black, and raspberries, I can assert that they grow better here than in the central West or in any portion of the country where the summer heat is intense. In fact, I found the red currant growing wild in abundance in the upper Cooks Inlet region, and the fruit was large and of a quality equal to the best of the cultivated sorts.

It will be seen from this that it is possible for settlers in Alaska to derive all the pleasure and profit from the kitchen garden for family use that it is possible to get anywhere.

But the fact that vegetables can be grown in Alaska does not necessarily make it an agricultural country. Successful agriculture must be based on the growth of the cereals and stock raising. No country can be said to be adapted to general farming unless the small grains can be grown there. It gives me pleasure to state that my efforts were successful in this particular also. Oats and barley of several varieties sown in the latter part of May all matured the 20th of September, and the grain is plump and heavy. Rye and wheat were not tested, as they are winter grains, but there is a tradition to the effect that the Russians grew rye here to a considerable extent before the transfer, and there is not the slightest doubt but that this grain can be matured here. I can not speak with so much confidence of wheat, as this grain requires a somewhat higher temperature for its development than does rye. But I consider it probable that even wheat will ripen in the coast region in suitable situations. In the interior, where the summers are warmer than on the coast, wheat can be grown successfully. This, at least, is the verdict of miners whom I have met, and who have assured me that they have seen not only wheat but also oats and barley grow up and ripen from seed dropped where horses had been fed.

Flax has attained the height of 3 feet here in Sitka this summer, and the English so-called horse bean, or windsor bean, has fruited in abundance. If the present season represents the average of sunshine and rainfall in the coast region of Alaska, there can be no doubt but that farming is not only possible but practicable. There are, of course, many problems in connection with the clearing and draining of the land, the improvement of the soil, and methods of culture, but enough has been learned to indicate that it will be to the advantage of the district to investigate the possibilities of agriculture thoroughly.

STOCK RAISING.

This industry can hardly be said to have a beginning. The Russians introduced a small hardy race of cattle which were raised somewhat extensively near Kadiak, and some of this breed still exists. Larger breeds have been introduced, and it is found that they do well. One man near Kadiak has a start of about 50 head. One animal was slaughtered for the U. S. S. *Wheeling* while lying there for a day in August. It was fat and of the right flavor. No better meat could be desired. In southeastern Alaska cows are kept to supply fresh milk, but there is no attempt to raise beef cattle. At Sitka cattle begin to get fresh feed about the 20th of April and live on this until about Thanksgiving. Last winter was an open one and stock cattle took care of themselves. The superintendent of the Apollo Consolidated Mine at Unga allowed a bull and a dry cow to hunt up their own feed, and he asserts that they looked well in the spring and soon became fat. The Alaska Commercial Company had some sheep upon an island for several years. They did well and took care of themselves.

Nevertheless, it would not be well to attempt stock raising without an abundance of feed constantly on hand. If the silo is an assured means of preserving fodder, there need be no lack of food for winter. Hay properly cured can not be relied upon, but oats, barley, clover, etc., for the silo can be obtained in abundance for the labor bestowed.

A silo has just been constructed at Sitka as a private enterprise. It is 14 by 20 feet in the clear. It has 2 by 10 inch studs, 16 inches from centers, walled with double-ship lap, with tarred paper between; is built upon a stone foundation, and has a cement floor 3 inches thick. It cost for labor and material \$175. There is now packed in it 30 tons of large coarse grass, known here as wild rye, which grows along the margin of the salt water. This was brought 10 miles and cost about \$90. Probably next season a larger amount could be put in for less than one-half, for natives, at \$2 per day and board, at a work which they have never seen done, are high priced laborers. A scythe is a novel tool to them. The Baptist Mission on Wood Island, under

the lead of Rev. Mr. Coe, has built a good silo this past summer. It is partly filled with oats which grew near by. This institution keeps 5 cows. The Swedish Evangelical Mission at Yakutat have used silage successfully for several years.

At present nearly all the feed is shipped from Puget Sound and San Francisco. Hay costs, laid in the stall, close to \$25 per ton.

Alaska is an ideal country for healthy hogs, and, as peas do well under cultivation, there is no reason why large numbers should not be reared. There is one drawback, however, and that is the mischievous ravens at Unalaska will persist in pulling off the pigs' tails. If any naturalist is skeptical about this let him inquire of Mr. Stanley Brown, the manager of the North American Commercial Company.

What has been said of hay and silage has reference to the coast line of Alaska. After one crosses the coast range to the interior he finds a different climate. Hay can be cured here. Last winter, when the agent of the North American Transportation and Trading Company at Circle City ran out of feed for a yoke of oxen which had proved very serviceable, he hired natives to bring hay which they cut beneath the snow, for which he paid them 5 cents per pound. He not only kept them alive, but continued working them on this kind of feed. Colonel Ray, United States Army, and Mr. P. W. Weare vouch for the truthfulness of this incident.

REINDEER.

That these animals in the future will be reared in vast herds can not be doubted by any person who is at all open to reason. Why is Alaska bound to have a vast population? The answer is, because it is a healthy country, where an abundance of wholesome food may be obtained at comparatively small effort. It will prove so, too, with this interesting animal, the reindeer. The camel is no more divinely fitted for the burning desert than is this animal for the frozen north. The moss which he loves grows over immense reaches. The importance of these animals to that northern section of Alaska can not be overestimated. One objection after another has been overcome.

It has been stated that the Siberian natives would not sell. If they did the animals would not stand transportation, the dogs would kill them, the Esquimaux would not be taught to take care of them. These difficulties have faded away. The chief promoter of this benevolent enterprise, Dr. Sheldon Jackson, has been assailed and accused of all manner of wickedness by a few who appear to be unable to appreciate the principles of this problem.

A few thousand dollars spent now in helping the Eskimo to obtain deer herds will save thousands in the future. The interest that these natives have taken in the deer is most gratifying. They understand how much it is to them to be supplied with them.

In the near future we shall expect to have the mail transported by reindeer all over northern Alaska in winter at a much less cost than is now paid.

There appear to be drawbacks to report for this year in regard to the station for collecting the animals upon the Siberian coast. What the facts are and who is at fault is not known here in Sitka. The master of the steamer *Del Norte* reported that he transported but 161 animals.

The usefulness of these animals has been so clearly demonstrated that Congress should make provision for as many as can be purchased from the Siberian herders.

FUR SEALS.

A few over 18,000 were taken upon the islands this year. All who visit the rookeries upon St. George and St. Paul can see that the number of animals has decreased rapidly. The rocks upon the hauling grounds have been worn smooth by the seals which have been climbing over them for ages. At some points they used to go far inland. But it is different now. The herds to-day occupy but a small rim. These animals are doomed to become extinct unless all pelagic sealing can be stopped. The branding of the females has proved a success and should be carried on until every female has the marks put upon her back. The brands spoil the market value of the skin, and then, too, they serve to identify the animal. The United States has a real property right in these animals even when they go from their rookeries to the feeding grounds, and the branding is a sure means of identification. Col. Jos. Murray, the chief agent of the United States upon these islands, has studied this whole subject of the fur seals in a practical way for several years. He maintains that branding these seals works as well as it does upon the cattle which feed upon the plains of Colorado.

The young seals have a strong and voracious enemy in the thrasher or killer whale. He is up to his business, and guards the passes from Bering Sea when the herds are on the move. So rapid and powerful are they that as they make a dart at a seal they cut him in two, throwing one part in the air, and yet are ready to devour it by the time it strikes the water.

If all pelagic sealing is forbidden, it would be well, as a further protection, that provision be made to place a bounty upon the heads of these hungry monsters.

The United States had no vessel on patrol duty this season. The British had three war vessels on the ground—*Amphion*, *Icarus*, and *Pheasant*. There were twenty-eight vessels sealing under the English flag, and one of these was seized by Capt. Frank Finnis, of the *Amphion*.

RESOURCES.

FURS.

Aside from the fur-seal skins taken upon the Pribilof Islands, there is no certain method of ascertaining the kinds of pelts taken, their number, and their value. There can be no doubt but that this industry will grow less and less each year in Alaska as the prospectors advance to every valley and stream in their search for gold.

If our differences on this question are to be settled by treaty, and the United States is to buy up the schooners, it would be well for Congress to make terms with the North American Commercial Company, and allow no more seals to be taken until the season of 1906.

BLUE FOXES.

Several parties have begun to raise these animals, and the Treasury Department has authority to lease certain outlying islands for this purpose. These men have had to exercise great care and patience, but those who have been at it longest are beginning now to be rewarded for their labors. These animals are quite numerous upon St. George and St. Paul. A large number of the seal carcasses are buried for the purpose of feeding them.

The silver fox has been tried, but complaint is made that the male fox succeeds in devouring most of the little foxes.

SEA OTTERS.

These animals are so valuable that hunting for them has been unremitting and there are very few left. It would be well for the Secretary of the Treasury to entirely prohibit the hunting of them for a long time. This would seem, at first, to be hard upon the natives. On the contrary, it would be for their benefit, for the number of animals now caught does not reward them. If they spent the time in working in the canneries or cutting wood along the Yukon River, they would be much better off. No doubt, if the Aleuts would cease hunting and manifest a desire to learn the cannery business, the managers of these institutions would work them in and cease to import Chinese labor when they learned the art.

DISASTERS.

Some sad events have been recorded in connection with Alaska during the past year. On a stormy night on the 5th of February, in Lynn Canal, the steamship *Clara Nevada* went to the bottom with all on board, about 60 souls. The cause of the sinking has never been ascertained.

On the 3d of April an avalanche broke loose from a crotch in the mountains in the neighborhood of the Chilcoot Pass, and persons were instantly caught and perished in this frightful mass of snow and ice as it went crashing across the valley.

There was a loss of three vessels of the whaling fleet, but no person was either drowned or died of hunger.

The schooner *Lady Jane Grey*, loaded with merchandise and passengers and bound for Alaska, went down off Cape Flattery. Only a few were saved. Amongst those who perished were Rev. Mr. Gambell, wife, and child. They were returning to their missionary station upon St. Lawrence Island.

In August a steamer towing a barge to the mouth of the Kuskokwim River was lost with all aboard save one native. Rev. Mr. Weber, wife, and child, returning to their Moravian mission field, on the upper part of this river, were passengers on this ill-fated craft.

A number of deaths occurred by drowning in the head streams of the Yukon and upon Copper River, and in Cooks Inlet, where there is a fearful rush of tide bores.

It is amazing what desperate chances men will take when once thoroughly possessed of a gold fever.

C. H. Meyer, a Columbia River fisherman, outfitted in a 6-ton schooner called the *Bertha*, at an expense of \$533. He put in cord wood for ballast. After crossing the bar into the Pacific, he set his course for Cooks Inlet. He was alone, was carried hundreds of miles from the land, but after sixty days of tossing was cured of his gold fever. He turned up in Sitka and sold his vessel and provisions for \$80, and returned home to Portland, Oreg. He was over 60 years old.

Another case is a party of men outfitting in Seattle, and among them one of the old business men of that city. They were bound for Kotzebue Sound. They brought up on Chirikof Island, which lies off the Semidi group, and were wrecked. The navigator thought he was entering Unimak Pass, but he was only 600 miles off his course.

WHALEERS IN THE ICE.

News came late last autumn that a number of vessels were caught in the ice in the neighborhood of Point Barrow. The United States revenue cutter *Bear* was outfitted and dispatched to render all possible relief. She approached the ice and lauded Lieutenant Jarvis and Dr. Call, who volunteered to carry relief to the distressed whalers. They made Port Clarence on their dog sleds and found there another noble volunteer in the person of Rev. Mr. Lopp, who went along to render assistance in the management of the reindeer, which were driven to be slaughtered for the starving men.

We admire the momentary heroism of men who risk their lives in trying to accomplish some great object under the fire of forts and batteries, but when heroism is continued and prolonged for months into the fierce blizzards of the Arctic, and is successful in its undertaking to relieve human suffering, it loses public attention and goes unhonored and unrewarded. Congress should not forget to properly honor these men. The Eskimo, who gave up his herd of deer to be driven to the hungry whalers, should be honored also.

THE U. S. S. WHEELING.

What could be more tantalizing than for a body of high-spirited naval officers and seamen to be far removed on the outskirts of Alaska while their classmates and fellows are reaping honor and glory and promotion over their heads because they have been at Manila and Santiago? The courage which keeps one at home is often greater than that which impels one to the front.

The *Wheeling*, separated from her sister ship, the *Marietta*, has been kept on the move, and has since the 1st of January steamed over 18,000 miles on Alaskan service.

This stretch of coast, so promising in its resources, should not be deprived of the service of a war vessel. A gunboat is a good sort of a knock-down argument when it comes to the final settlement of a question.

ALASKA IN CONGRESS.

The Republican party had this plank in its last platform:

We believe the citizens of Alaska should have representation in the Congress of the United States, to the end that needful legislation may be intelligently enacted.

The people of Alaska now call upon the Republicans in Congress to keep this promise, and it is earnestly hoped that no obstacle will be placed in the way of such legislation. If the reasons for Alaska having a Delegate in the halls of Congress in June, 1896, were good, they are emphatically strong now in the closing months of 1898.

SALMON FISHERIES.

The following statistics are from the report of the agent for the protection of Alaska salmon fisheries for last year:

Name of cannery.	Owned by—	Location.	King.	Salmon taken.				Cases.	Barrels.	Half bar- rels.	Market value.
				Red.	Silver.	Pink or hump- back.	Total.				
North Pacific Trading and Packing Co.	North Pacific Trading and Packing Co.	Klawak.	130,881	18,468	4,187	153,536	11,513	440	847,961		
Mediatashla Industrial Co.	Mediatashla Industrial Co.	Mediatashla	84,000	6,720	154,000	344,720	15,400		40,000		
Oroca	Pacific Sleson Whaling Co.	Oroca	230,000	100,000		320,000	28,000		87,000		
Chignik	do	Chignik Bay	240,000			240,000	28,000		71,700		
Runners Bay	do	Runners Bay	84,000	560,000		644,000	35,000		106,000		
Karluk	do	Yuk Bay	160,000			190,000	15,000		46,000		
Kechikan Saliery	Clark & Martin.	Yuk Bay	20,000	40,000	500,000	560,000			12,000		
Boston Fishing and Trading Co.	Boston Fishing and Trad- ing Co.	Kechikan	60,000	15,000	190,000	265,000	22,300		70	1,500	
Quadra Bay	Quadra Packing Co.	Yes Bay	912			263,912			75		
Berardoff Packing Co.	Quadra Packing Co.	Cape Fox	80,000		300,000	380,000	24,500				
Naknek Packing Co.	Naknek Packing Co.	Redish Bay	64,508	8,851		73,359	14,070		250		
Chignik	Naknek Packing Co.	Naknek River	220,000			220,000	18,000		600		
Uyak	Hume Bros. & Hume.	Chignik Bay	125,000			125,000	12,008				
C. E. Whitney & Co. (saliery).	do	Uyak Bay	168,824			168,824	18,375				
W. N. Nelson & Co. (saliery).	C. E. Whitney & Co.	Naknek							2,436		
Eagle Harbor Packing Co.	W. N. Nelson & Co.	Ugashik							1,460		
Alaska Packers' Association	Eagle Harbor Packing Co.	Eagle Harbor							616		
Alaska Packing Co.	Alaska Packers' Association	Nushagak	18,134	1,240,080	35,348	1,443,563	107,856	210			326,613
Arctic Packing Co.	do	do		429,655		430,557	84,676				104,028
Karluk Packing Co.	do	Naknek		1,865,731	1,500	1,867,231	156,375				489,125
Hume Improvement Co.	do	Karluk									
Ugashik Fishing Station	do	do									
Arctic Fishing Co.	do	Ugashik									
Pacific Packing Co.	do	Aktik									
Gleaser Packing Co.	do	Kneloff	513,000	28,000		541,000	37,401				112,203
Point Roberts Packing Co.	do	Chignik Bay	354,800	10,510	5,800	382,800	38,538				115,614
Ugashik Fishing Station	do	Odiak	546,472	90	239,340	562,782	88,159				114,477
Sundry (estimated)	do	Pyramid Harbor	966	11,123	435,445	447,534	37,446				69,403
	do	Fort Wrangell	14,796	48,817	597,542	661,155	45,918				112,338
	do	Loring	4,946	108,334	1,275,655	1,388,935	62,040				147,991
	do	Kogring	131,567	19,478	1,124,610	1,275,655	62,040				214,580
	do	Selma River	345	760,632		760,632	55,508		1,989		191,804
	do	Egegak	259	463,668		463,668	38,272		1,709		106,717
	do	Southern	257	203,458		203,458	203,715		8,589		52,040
	do	Alaska.							2,000		30,000
Total	Several parties	Southern	41,546	8,797,274	1,016,057	2,988,730	12,843,607	909,538	15,888	1,500	2,977,019

s Salmon bellies.

Name of cannery.	Owned by—	Location.	Whites.	Natives.	Chinese.	Total.	Value of tin plate.
North Pacific Trading and Packing Co.	North Pacific Trading and Packing Co.	Klawak.....	22	100	7	129	\$7,455
Metlakahla Industrial Co.	Metlakahla Industrial Co.	Metlakahla ..	14	204	.....	218	6,500
Orca.....	Pacific Steam Whaling Co.	Orca.....	116	.....	80	196	11,625
Chignik.....	do.....	Chignik Bay..	90	.....	60	150	9,750
Hunters Bay.....	do.....	Hunters Bay..	10	60	80	150	14,000
Karluk.....	do.....	Uyak Bay.....	100	20	60	180	6,000
Ketchikan Saltery.....	Clark & Martin..	Ketchikan.....	30	20	.....	50	.....
Boston Fishing and Trading Co.	Boston Fishing and Trading Co.	Yes Bay.....	24	25	50	99	10,000
Quadra Bay.....	Quadra Packing Co.	Cape Fox.....	28	20	50	98	10,000
Baranoff Packing Co.....	Baranoff Packing Co.	Redfish Bay..	3	17	31	51	5,700
Naknek Packing Co.....	Naknek Packing Co.	Naknek River..	55	10	75	140	10,000
Chignik.....	Hume Bros. & Hume.	Chignik Bay..	67	.....	65	132	7,200
Uyak.....	do.....	Uyak Bay.....	107	.....	60	167	8,250
Bristol Bay Canning Co..	Alaska Packers' Association.	Nushagak.....	194	40	102	336	.....
Alaska Packing Co.....	do.....	do.....	.....	.....	102	102	50,700
Arctic Packing Co.....	do.....	do.....	.....	.....	102	102	.....
Do.....	do.....	Naknek.....	57	10	102	169	16,300
Karluk Packing Co.....	do.....	Karluk.....	.....	.....	.....	.....	.....
Hume Packing Co.....	do.....	do.....	258	25	390	673	75,500
Alaska Improvement Co.	do.....	do.....	.....	.....	.....	.....	.....
Uganuk Fishing Station.	do.....	Uganuk.....	.....	.....	.....	.....	.....
Arctic Packing Co.....	do.....	Alitak.....	37	10	57	104	17,600
Arctic Fishing Co.....	do.....	Kusiloff.....	53	20	102	175	15,300
Chignik Bay Packing Co.	do.....	Chignik Bay..	86	.....	103	189	18,000
Pacific Packing Co.....	do.....	Odiak.....	89	.....	66	155	11,000
Pyramid Harbor Packing Co.	do.....	Pyramid Harbor.	84	334	87	505	17,000
Glacier Packing Co.....	do.....	Fort Wrangell	34	74	80	188	21,600
Alaska Salmon Packing and Fur Co.	do.....	Loring.....	37	200	130	367	29,200
Point Roberts Packing Co.	do.....	Koggiung.....	88	25	150	263	26,100
Ugashek Fishing Station.	do.....	Selina River..	76	24	102	202	18,000
Egegak Fishing Station..	do.....	Egegak.....	29	6	.....	35	.....
Total.....			1,788	1,244	2,293	5,325	423,380

Name of cannery.	Owned by—	Location.	Steamers.			Sailing vessels.			Lighters and boats.	Seines.	Gill nets.
			Number.	Tons.	Value.	Number.	Tons.	Value.			
North Pacific Trading and Packing Co.	North Pacific Trading and Packing Co.	Klawak.....	2	15	\$5,250	.....	.....	.....	7	5	.....
Metlakahla Industrial Co.	Metlakahla Industrial Co.	Metlakahla ..	2	29	10,000	.....	.....	.....	7	9	5
Orca.....	Pacific Steam Whaling Co.	Orca.....	3	250	35,000	1	2,000	\$30,000	43	3	43
Chignik.....	do.....	Chignik Bay..	1	30	15,000	1	1,400	20,000	1	2	28
Hunters Bay.....	do.....	Hunters Bay..	2	100	2,500	.....	.....	.....	6	10	.....
Karluk.....	do.....	Uyak Bay.....	2	60	2,500	1	1,400	2,000	5	5	.....
Ketchikan Saltery.....	Clark & Martin..	Ketchikan.....	.....	.....	.....	.....	.....	.....	11	4	.....
Boston Fishing and Trading Co.	Boston Fishing and Trading Co.	Yes Bay.....	2	.....	.....	.....	.....	.....	.....	.....	.....
Quadra Bay.....	Quadra Packing Co.	Cape Fox.....	1	18	6,000	.....	.....	.....	12	14	.....
Baranoff Packing Co.....	Baranoff Packing Co.	Redfish Bay..	1	2	10,000	.....	.....	.....	4	2	.....
Naknek Packing Co.....	Naknek Packing Co.	Naknek River..	1	5	1,200	1	1,200	15,000	25	2	30
Chignik.....	Hume Bros. & Hume.	Chignik Bay..	1	10	3,000	1	480	7,000	17	3	12
Uyak.....	do.....	Uyak Bay.....	1	40	14,000	1	1,276	15,000	17	6	3

Name of cannery.	Owned by—	Location.	Steamers.		Sailing vessels.		Lighters and boats.	Seine.	Gill nets.	
			Number.	Tons.	Value.	Number.				Tons.	Value.
Bristol Bay Canning Co.	Alaska Packers' Association.	Nushagak	4	44	\$21,000	2	2,167	(b)	98	180
Alaska Packing Co.	do	do				2	1,637	\$30,000		
Arctic Packing Co.	do	do				2	1,389	31,000	30	45
Do	do	Naknek	1	5	4,500					
Karluk Packing Co.	do	Karluk	6	122	48,150	1	1,725	(b)	130	6
Hume Packing Co.	do	do				4	4,662	86,000		
Alaska Improvement Co	do	do								
Uganuk Fishing Station	do	Uganuk								
Arctic Packing Co.	do	Alitak	1	20	10,000	1	1,175	(b)	18	5
Arctic Fishing Co.	do	Kusiloff	3	83	34,100	1	1,172	(b)	28	30
Chignik Bay Packing Co.	do	Chignik Bay	2	48	20,250	1	1,272	25,000	31	5
Pacific Packing Co.	do	Odiak	3	214	37,000	1	1,139	20,000	35	2
Pyramid Harbor Packing Co.	do	Pyramid Harbor	2	58	24,800	1	1,384	(b)	51	50
Glacier Packing Co.	do	Fort Wrangell	2	52	24,500	3	2,052	16,000	36	8
Alaska Salmon Packing and Fur Co.	do	Loring	2	56	24,000	3	2,052	32,000	1	7
Point Roberts Packing Co.	do	Koggiung	5	248	54,000	2	2,085	40,000	32	25
Ugashak Fishing Station.	do	Selma River	2	60	27,500	1	771	(b)	58	21
Egegak Fishing Station	do	Egegak	1	5	1,600	1	295	15,000	9	5
Total			58	1,574	435,550	31	32,754	384,000	712	98

a Traps.

b Charter.

What was said in last year's report on this topic can only be reiterated now with increased emphasis. This industry is one of immense importance and value, for it is a food question and it runs into the millions of dollars. The laws which ought to govern it are not upon the statute books, and those which are printed are variously interpreted and not at all enforced.

Seven thousand dollars have been appropriated to pay for the service of two inspectors for this year. But if the 35 or more places as given above where the fish are preserved were connected by straight lines, it would amount to about 3,000 miles. But each cannery has several fishing streams, and if these were visited and examined as they should be, the inspectors would have to travel at least 10,000 miles more to fulfill their duty. Now what is the truth? It is this: They come to Alaska and have not even a rowboat at their command for this service. They get around as best they can where the mail steamers touch. When they visit a cannery, they are compelled to be the guests of the superintendent, for there is no other place for them to stop and obtain meals and a night's lodging. Let it be said to the credit of the cannery people that they are always hospitable and ready to render any reasonable service to aid these officers. But can anything be more shortsighted, yea, downright careless, than for the great United States Government to allow its officers who are to protect one of its most magnificent industries to be placed in such a ridiculous position?

This whole subject of the salmon fisheries here needs overhauling from A to izzard. It is not at all upon a satisfactory basis. This season the Alaska Packers' Association filed a complaint against the Pacific Steam Whaling Company and others, and had them enjoined not to do so and so. The Pacific Steam Whaling Company and others file com-

plaint against the Alaska Packers' Association and obtain an injunction. Another man upon Karluk Spit sits with a Winchester rifle across his knees and swears that he will shoot the first fellow who offers to remove his lumber. Last season there was bad blood stirred up.

Nearly all of these places are far removed from any legal authority. Karluk is 785 miles from Sitka. If this state of affairs is not at once inquired into and remedied, but is allowed to proceed to violence and bloodshed, as it will if further neglected, the blame will rest upon Congress.

In the estimate of population given above, the 5,325 hands employed in the canning business were not included. Nearly all of these people are brought up from San Francisco at the beginning of the season in large sailing vessels, together with material and supplies of all kinds. Contracts are made with laborers before they leave the city, and they are not to be paid off until they return in the fall. Complaint has been made of this system of doing business as not being fair to Alaska; but the cannery people are not to be blamed for this, when it is recalled that they have scarcely any protection in Alaska to enforce contracts. Most of them are removed hundreds of miles from the nearest commissioner, who would be feeble indeed if applied to. There is no legal way of appointing justices of the peace and constables for these transient communities. It is strange that business men would risk such large sums in buildings, machinery, gear, steam vessels, etc., without better protection.

It is to be regretted that the natives of western Alaska can not be employed more and taught to do the work which is now intrusted to the imported Chinese. Several years ago the superintendent of the North Pacific Trading and Packing Company at Karluk took the natives in training, and it will be noticed that he now employs but 7 Chinese. This season the loss to the Alaska packers at Karluk will run into the tens of thousands, because they contracted with the Chinese at so much a case and guaranteed so many thousand cases. The run of fish this year at this place has been light, and will probably amount to 80,000 cases less than the pack of last year. If the natives could do this work there would be no such loss, for they have been brought up as sea otter hunters. This occupation is almost gone, and it surely would be an act of benevolence if these people could be more largely employed in the canning factories.

The Alaska Packers' Association have gone to great expense in establishing a salmon hatchery, and have successfully demonstrated that they can be hatched in vast numbers. They are not justified in such an undertaking, for in the present state of the law there is no certainty that they shall reap where they have sown. The hatchery business should be intrusted to the United States Fish Commissioner alone, and every cannery pay its proportion of the expense according to its pack.

If we are justly concerned about the fur-seal herds and their constant decrease in numbers, with how much greater anxiety should we be solicitous about this salmon industry. Let it be remembered that the value of the annual pack is greater now than that of the seals ever was when at their greatest numbers.

In the light of the laws and experience of the people in British Columbia on this subject, with the aid and suggestions which could be given by the men who are in the business here, and with the learning of such men as Captains Tanner and Moser, who have commanded the *Albatross*,

and Professor Townsend, who has long been in connection with the Fish Commission, a fair and satisfactory law with proper penalties and provision for the enforcement of the same could be drawn up and presented to Congress for enactment.

MINING.

This is the all-absorbing topic in Alaska. Section 8 of the organic act provides:

The laws of the United States relating to mining claims and the rights incident thereto shall from and after the passage of this act be in full force and effect in said district.

Titles as secure as in California or Colorado may be obtained to mining claims. It is this security that has given buoyancy and confidence to those who are ready to invest their means in mining enterprises.

It is a pleasure to be able to praise at least one clause of the organic act. When contrasted with the negatives of that same instrument, the above provision appears more significant—for instance, the last clause of section 8, as quoted once before:

But nothing contained in this act shall be construed to put in force in said district the general land laws of the United States.

One clause of section 9:

But there shall be no legislative assembly in said district, nor shall any Delegate be sent to Congress therefrom.

The past year has been one of wonderful progress in this industry. The attention of the world has been attracted by the rich discoveries upon the Klondike. During the winter and spring all sorts of vessels were put into the Alaska trade, hailing from Vancouver and Victoria, British Columbia, the Puget Sound ports, Portland, and San Francisco. They were filled with passengers and cargo to the very limit. There was a great rush for the passes, and thousands of tons of freight could be seen piled upon and under the snow upon the summits. The toil, hardship, and suffering that these men endured can never be calculated. The United States contributed by far the largest volume to this stream. They came from all quarters, Florida, Massachusetts, Texas, Indiana, Colorado, and Montana—in fact, a large number from every State of the Union, California, Oregon, and Washington sending the largest contingents.

These men, as a class, are as fine specimens of manhood as the country affords. They are really a body of select men. Every profession and occupation is represented. Preachers, lawyers, doctors, gamblers, machinists, railroad men, lumbermen, farmers, etc., all joined in the procession over the passes.

It is calculated that 3,200 outfitted for Copper River, several hundred went over the divide at Yakutat, and some parties went over the Dalton trail and worked their way up the White River, one of the largest branches of the Yukon. Cooks Inlet, Resurrection Bay, Golovin Bay, Kotzebue Sound, Koyukok River, and many other places have all been visited by prospectors this season. The declaration of war against Spain checked the tide.

Most of the Americans who proceeded to Dawson, in Northwest Territory, complained of the mining rules and regulations and the manner in which they were carried out. This had the effect to drive many upon the Alaska side, and the claims which were abandoned for the first onrush to the Klondike were relocated, and much other valuable ground discovered, which will keep large numbers of men there this winter.

A new town has sprung up on the Yukon, called Eagle City. This will be the distributing point near the boundary for supplies on the streams crossing and immediately west of the line.

There is no way of ascertaining the amount of dust washed out upon the Alaska side. The amounts given for the Klondike and its tributaries vary very much. Several reasons are given why the output is smaller than was anticipated—the scarcity of supplies, especially lights, the high price of labor, and the 10 per cent royalty exacted. Many claims are being held with the expectation that supplies will be more abundant and not so dear, and consequently cheaper labor, and that the loud complaint against royalty will cause the Ottawa government to abolish it. There will be no lack of supplies this winter, but there appears to be a determination among the miners to keep up wages and the royalty is still demanded. So we can expect the product for the coming year to be much curtailed.

Toward the close of the season very important discoveries have been made upon Pine Creek, which flows into Lake Atlin. This is a district which lies near the line separating British Columbia and Northwest Territory. There was a stampede for claims and a large area has been staked off. Many men will prospect there this winter.

Many who tried Copper River found no inducement to remain. They underwent much hardship in cold, rapid streams and from the annoyance of mosquitoes. Many complained of dysentery and kidney trouble from the use of the water. Colors of gold were found nearly everywhere, but they were on the surface. High water throughout the summer prevented the prospectors from sinking their holes to bed rock, and also from examining the bars very closely. It is probable that 500 or 600 men will remain in this section over winter. Some Colorado men reported that they were well pleased with their prospects on a small stream 30 miles up the river. The gold is fine, but angular and heavy.

The amount of dust brought out of Turnagain Arm, Cooks Inlet, will not be equal to the product of last season. This is on account of high water washing out wing dams and destroying preparatory labor.

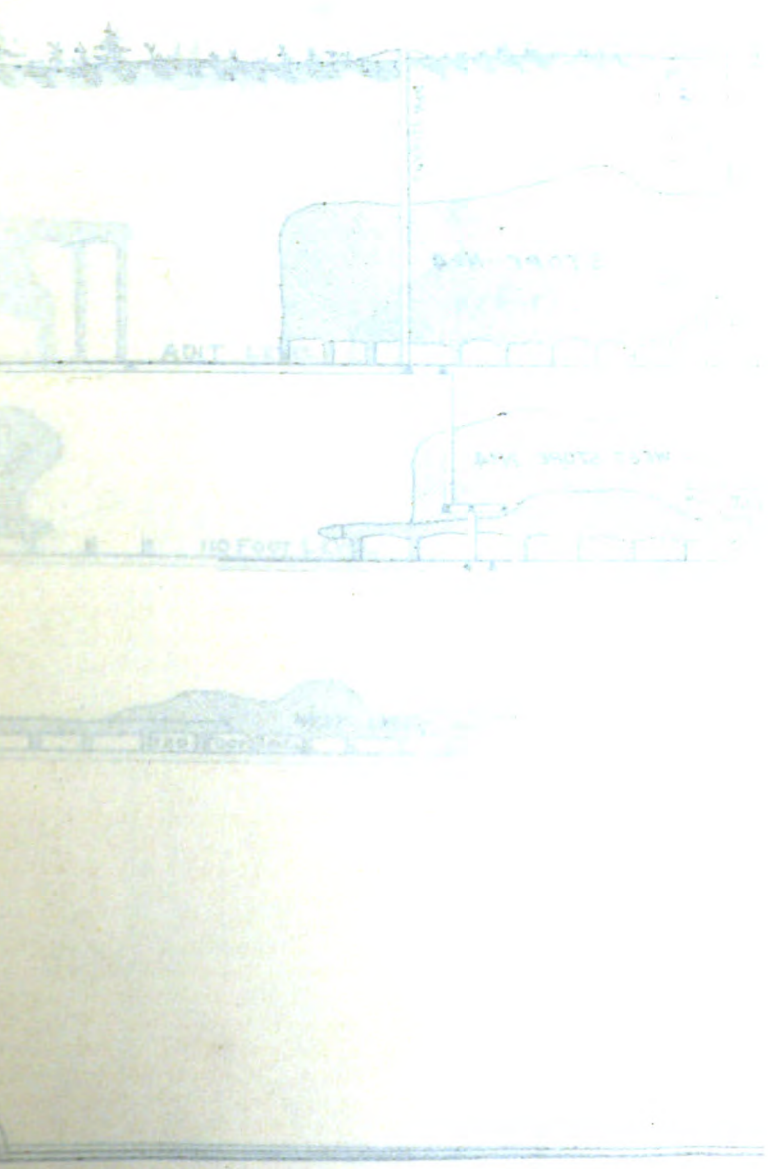
The last boats from St. Michaels bring news of important finds in the neighborhood of Golovin Bay.

A large extent of country has been run over this year, but probably a majority of the men never saw a pan of dirt washed before coming to Alaska, and it is altogether likely that rich placers will be found where many of these men camped.

If we turn our attention to quartz mining we find everything encouraging. Very rich ore was discovered in the vicinity of Ketchikan, and many locations have been made and considerable development upon them.

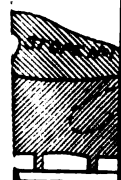
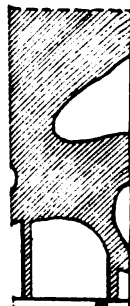
Quartz locations have been made at various places around the coast and upon the islands as far as Unalaska. The greater number of these are held by poor men who are not able to do much development work. Alaska is a splendid field for a class of men who can command capital and who can examine these discoveries and come to terms with the owners for the purpose of development and sale. Any amount of capital is ready for investment upon properly developed properties. The records show the locations of hundreds of claims upon which only enough work has been done to hold possession of them. Wherever development work has been undertaken and prosecuted in earnest, satisfactory results have followed in most cases. When the history of these developments is studied carefully as they have proceeded in Alaska so far, investors can come forward with a great degree of confidence to undertake such work. In fact, there are very few failures recorded.

REFERENCE
HAS BEEN PUT ON BY THE DEPARTMENT 1888
THE FIRST CUT DURING THE YEAR 1897



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There are rich bodies of ore in the neighborhood of Sum Dum, and favorable reports come from the Bald Eagle and Sum Dum Chiet, upon each of which there is a stamp mill.

Coming north along the coast, Suetishham is reached. Here a number of quartz locations have been made and so much development work with favorable results that the owners are applying for surveys for ledges and mill sites.

The mills upon Sheep Creek, 4 miles from Juneau, have been producing bullion for several years, but this year the ore bodies have given much better returns.

In Silver Bow Basin, upon Douglas Island, across Gastinaux Channel from Juneau, are the works of the Alaska Treadwell Gold Mining Company, Alaska Mexican Gold Mining Company, and Alaska United Gold Mining Company, different corporations, but under the control of the same superintendent and board of directors with the exception of one name. Every Alaskan takes pride in these plants, as if he had a personal share in them. From the time that John Treadwell took hold of the original claims and started to prospect with his five-stamp mill until the present, every step has been thoughtfully considered. There has been a steady growth, and soon there will be five magnificent mills in full operation dropping 900 heavy stamps day and night. The company is simply applying in Alaska all the good things that have been wrought elsewhere in mining and milling, and especially in California. The new mills and machinery are the best that mining engineers can plan and construct.

Thanks are hereby tendered, in behalf of Alaska and of those who value correct and truthful information, to Mr. Robert Duncan, jr., the superintendent, and to his board of directors, for the annual statements which they print.

All persons who are engaged or expect to engage in mining in Alaska can study these reports with profit.

Alaska is sadly in need of wise mining superintendents who can plan how not to spend money uselessly. The Treadwell plants serve the purpose of a vast school of mines, and it behooves all men who are conducting mining enterprises here to visit these works frequently and instruct themselves.

Below are the bullion statement and longitudinal section of workings of the Alaska Mexican Mining Company.

Bullion statement, twelve months ending December 31, 1897.

Date of shipment.	Crushed.	Sulphurets saved.	Sulphurets treated.	Yield free gold.	Per ton in free gold.	Yield sulphurets.	Per ton from sulphurets.	Total yield.	Total yield per ton.
1897.	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>						
January 15.....	11,973	280	210.9	\$18,816.39	1.5716	\$8,194.66	\$38.86	\$27,011.05	2.2560
February 15.....	11,245	300	281.4	15,781.41	1.3969	9,588.33	34.07	25,319.74	2.2616
March 15.....	12,036	170	344.6	14,718.14	1.2228	12,815.46	37.21	27,533.60	2.2876
April 15.....	13,206	170	486.4	18,531.29	1.4083	14,655.60	33.58	33,186.89	2.5181
May 15.....	14,369	290	289.3	23,762.89	1.6537	9,501.10	33.15	33,263.99	2.3212
June 15.....	14,107	285	294.6	17,425.95	1.2852	8,813.89	29.92	26,239.84	1.8900
July 15.....	14,409	335	258.7	19,078.61	1.3237	7,879.61	30.46	26,953.22	1.8705
August 15.....	13,204	258	289.6	18,022.52	1.3649	7,482.55	25.84	25,505.07	1.9316
September 15.....	13,118	197	248.9	16,995.13	1.2956	6,396.11	25.70	23,391.24	1.7811
October 15.....	13,091	275	266.1	21,358.94	1.6316	6,693.16	25.16	28,052.10	2.1428
November 15.....	12,925	280	281	20,755.05	1.6019	8,115.74	31.09	28,870.79	2.2298
December 15.....	14,322	283	291.2	21,180.39	1.4789	9,090.75	31.18	30,261.14	2.1129
Total.....	158,006	2,863	3,472.5	\$226,321.71	1.4824	\$109,806.96	\$31.48	\$335,628.67	2.1242

Upon Gold Creek, immediately back of Juneau, the Ebner Gold Mining Company have been running a 10-stamp mill steadily with a body of ore looking better as development work proceeds.

Juneau Mining Company, with its 30-stamp mill, has been turning out gold bullion from ore that is rich. This will close down for the winter.

Keeping along the shore of the mainland, there are a number of places between Juneau and Berners Bay where claims have been located and a very considerable amount of work done upon them; such are the claims upon Lemon and Montana creeks and in Yankee Basin. Nearly the whole country around Berners Bay has been located.

It is reported that the property formerly known as the Nowell Gold Mining Company, upon which there is a 40-stamp mill, has been working all season upon rich ore.

The Jualin mine, with its 10-stamp mill, has been a producer for several years and has kept at work this season.

The Alaska Gold Mining Company, of Indiana, whose headquarters are at Indianapolis, Ind., report that they have purchased a very valuable group of ten claims in the very heart of the Berners Bay mining district, lying between and adjoining the Julian mine and the famous Comet group, and have a full force of men at work developing their property, having already erected all necessary outbuildings, including a large hotel. Their main working tunnel, 7 by 8 feet, is under good headway, and has cut two very fine veins of ore, showing considerable free gold, and in addition to this, on the company's property, a number of surface croppings of veins ranging from 3 to 18 feet in width. Their mining machinery is purchased to operate the property, and a greater portion of it is now on the ground. The development work will be continued all winter, and during the early part of next spring their stamp mill will be erected and in operation. We predict great results from this property.

The Apollo Consolidated Mining Company owns a number of claims upon Unga Island, one of the Shumagin group. A 40-stamp mill is kept in constant operation, and it produces about \$30,000 per month. The labor roll averages 150 men. This is a complete and well-managed mining property. The machine shop is well supplied with fine tools, and has a foundry connected with it sufficient to turn out fair-sized castings.

There is no timber on these islands. It is all shipped from Puget Sound. A four-masted schooner was there in August with 900,000 feet.

This company has paid attention to the comfort of their employees by being particular about all sanitary arrangements. Drying rooms are kept at the right heat for the men's clothes, and there is an abundance of hot and cold water for them to bathe. The men pay hospital dues, and a surgeon, with all proper supplies, is always ready for any emergency. Altogether this is a fine showing for successful mining in Alaska.

Other groups of claims upon the same island have been largely developed this year, and no doubt within a year or two extensive works will be erected to work the ore.

In various places upon Prince William Sound claims have been located. Many of these contain a good percentage of copper, and notably so those upon Latouche Island. These have been under examination this past season by various mining experts, and among them has been Mr. Couch, of Butte, Mont. Samples of ore from Knights Island and other places have been sent in.

The sand washing in the vicinity of Lituya Bay goes quietly on year

by year. There were about 25 men employed there this season. Some years the returns are greater than in others. Various patent processes have been tried upon this sand, but so far none worked successfully.

The first attempt at quartz mining in Alaska was upon the Stewart Tunnel, at the head of Silver Bay, 10 miles from Sitka. This property has been involved in litigation for years, but the title to it will soon be made clear.

The Lake Mountain Mining Company's claims, upon which there is a fine stamp mill, has been bonded lately.

A number of claims about 4 miles from Sitka have had some development work done upon them and they are bonded by parties in California. A sawmill and two prospecting mills of two stamps each are on the ground.

The Pande Basin is situated on Baranof Island, about 10 miles east of the town of Sitka. The area of the basin is about 160 acres, being about 1 mile long by a quarter of a mile in width. A company under the name of the Pande Basin Gold Placer Company has been formed in the city of New York, and is now busily engaged in opening up this basin. A 6-foot wagon road has just been completed, at a cost of \$17,000, and 40 men are now employed on development work, such as sinking shafts and driving a tunnel, by which it is proposed to lower a lake (which is part of the basin) about 60 feet. The cost of tapping this lake is about \$15,000. A small prospecting mill has also been erected and a thorough test will be made during the coming winter. Assays of the auriferous sand and samples of surrounding quartz ledges have averaged \$40 a ton, while single specimens have assayed as high as \$900 to the ton. It is estimated that there are 40,000,000 tons of sand in the basin, and the ledges have been traced 1,500 feet, at an average width of 6 feet. Gen. Henry I. Willey, of California, is the mining engineer who is planning and conducting these operations.

A large number of claims have been located in this district and are held by doing the annual assessment work. It is an inviting field for intending investors and promoters to examine with care.

The sum total of effort in quartz mining has been very great this year, and many works have been started which have all the promise of maturity into steady bullion producers.

COMMERCE.

The following statistics have been obtained from the collector of customs at Sitka, and the items about wharfage at Juneau, Douglas Island, Skagway, Dyea, and Sitka from an independent source.

Vessels entered from a foreign port.....	454
Vessels cleared for foreign ports.....	470
Vessels entered from domestic ports.....	566
Vessels cleared for domestic ports.....	488
Entries of merchandise for duty.....	561
Entrance of merchandise free of duty.....	63
Entries for export to adjacent British provinces.....	2,404
Entries for consumption liquidated.....	269
Certificates of registry granted.....	6
Certificates of enrollment granted.....	18
Licenses for coasting trade granted.....	34
Licenses to vessels under 20 tons granted.....	53

VALUE OF EXPORTS.

Domestic.....	\$38,882.00
Foreign.....	1,089.00

RECEIPTS FROM ALL SOURCES.

Duties on imports.....	\$36,180.41
Tonnage tax.....	4,381.37
Fines, penalties, and forfeitures.....	1,408.21
Miscellaneous customs receipts.....	71.00
Storage, labor, cartage, and wharfage.....	2,887.95
Official fees.....	3,700.13
Total.....	48,629.07

EXPENSES OF COLLECTION.

Fees retained by collector or surveyor, act June 10, 1890.....	\$3,700.13
Commissions allowed and paid to collector.....	1,216.82
Salaries of collectors, deputies, clerks, inspectors, weighers, storekeepers, etc.....	29,918.71
Rents.....	756.00
Miscellaneous expenses.....	2,993.30
Boat hire.....	34.25
Total expenses for the month.....	\$48,619.21

MERCHANDISE IMPORTED, EXPORTED, AND IN TRANSIT.

Value of merchandise from foreign countries imported (entered for consumption) for the year commencing July 1, 1897, and ending June 30, 1898:

Imported in American vessels.....	\$33,060.00
Imported in foreign vessels.....	96,149.00

Total.....	129,229.00
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Value of merchandise exported to British Columbia and Northwest Territory for the year commencing July 1, 1897, and ending June 30, 1898..

44,165.00

Value of foreign merchandise in transit (imported and immediately exported) to British Columbia and Northwest Territory, for the year commencing July 1, 1897, and ending June 30, 1898, via—

Wrangell.....	\$804,720.00
Dyea.....	1,211,320.00
Juneau.....	179,889.00

Total.....	2,195,929.00
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Transactions via St. Michaels not included in this report.

VESSELS ENGAGED IN THE FOREIGN TRADE. ENTERED AND CLEARED FOR THE YEAR.

Entered:	Tons.
With cargo.....	178,691
In ballast.....	81,425
Total.....	260,116
Cleared:	
With cargo.....	14,850
In ballast.....	169,583
Total.....	184,433

IMPORTS BY PORTS.

Juneau (all docks), for year 1897:	Tons.
Merchandise.....	15,000
Coal.....	6,500
Douglas City (exclusive of Treadwell):	
Merchandise.....	1,500
Skagway (all docks), from May 1, 1898, to October 1, 1898, five months:	
Merchandise by steamers, all lines.....	6,797
Railroad material, by barges with tugs.....	4,770

Dyea, from May 1, 1896, to October 1, 1896, five months:

Merchandise by lighters, from Skagway, per P. C. S. S. 1, 063

Estimated outside steamers as much more.

Sitka (all steamers), September 1, 1897, to September 1, 1898 (exclusive of Government coal and merchandise):

Merchandise and coal sold at port..... 2, 499

NAVAL STATION.

Alaska, with its chain of islands, bends like a sickle and embraces the whole North Pacific Ocean. The Yukon Valley will steadily grow in importance and immense commerce must be carried on through the passes into Bering Sea. The completion of the Siberian Railway to Vladivostok and our increasing trade relations with Japan, and the probability that Sitka will in the near future be united by marine cable to the outside world, all tend to show the importance of the Navy Department keeping Alaska well in hand. This it has done fairly well since the spring of 1879, after the people of Sitka had appealed to the British naval authorities at Esquimalt to send a gunboat at once to protect them. The question of location was a matter of much concern to the Russians. At first they settled and established themselves at St. Paul or Kadiak, but after weighing all their interest in the light of experience, they selected Sitka as the most desirable place from which to command and govern the whole Territory. It has a front door to the ocean, and a back door to the inside passages of the southeastern section. Its harbor is ample and safe for all classes of shipping. Naval commanders have reported on this matter from time to time.

On June 21, 1890, President Harrison set aside by proclamation "All of that island situated directly opposite the town of Sitka, known as Japonsky Island, for naval and military purposes." It is a fine location and well suited for naval purposes. The Navy has on it now two well-constructed buildings for shells and powder, and a wharf which will soon fall for want of repairs. An appropriation of \$5,000 is now available to build a much better one and in a better place. The marine barracks is in the town, and while the quarters are comfortable the plot of ground is very small for such purposes. The sick bay and naval stores and repair shop are in an old log building, covered with rustic work to hide its ugliness and decay. It is not a proper hospital building for sick persons. In view of the foregoing it is recommended that Japonsky Island be built up as a naval station, and that all buildings connected with the Navy be concentrated upon it.

PUBLIC BUILDINGS.

The United States commissioners and deputy marshals at Kadiak, Unga, Unalaska, St. Michaels, Circle City, and Dyea are very illy provided with proper court rooms and jails. Attention was called last year to the dilapidated condition of the buildings at Sitka. These are old Russian block or log houses which were turned over to the Government at the time of the transfer. They have been repaired year by year by cutting out rotten courses of logs, raising floors, and sticking rustic and paint, in an endeavor to make them look respectable. It is a waste of material to attempt this any longer. The structure known as the barracks, used as a jail and court room, and as quarters for the marshal, district attorney, and judge, would be condemned within twenty-four hours in any place where there was a board of health.

The building called the custom-house has had the corners cut away and filled in with square timbers, but these are now giving way, and the walls in other places are sinking. The money spent on repairs for this hulk would have built a handsome custom-house. The houses used as quarters for the governor and the clerk come under the same category of decayed hulks. More office room is needed. The business of the collector's office has largely increased. A board of local inspectors has been added. There is a surveyor-general and his force of draftsmen, clerks, etc., the register and receiver, and agents of the Agricultural Department.

Alaska needs a penitentiary built in accordance with modern ideas. A suitable and well selected reservation has been made by proclamation of the President, and in view of the above facts it is urgently recommended that Congress appropriate the sum of \$110,000 for a penitentiary and buildings for offices, etc., which are to be planned and constructed under the direction of the Government architects.

EDUCATION.

Congress has been appropriating \$30,000 annually for the industrial and elementary education of children in Alaska, without reference to race. It was recommended last year that the amount be increased to \$60,000, but it was not. This work is under the direction and control of the Bureau of Education. Its plans contemplated the expenditure of such an amount to keep going the schools already in hand. New places have suddenly grown up. At Skagway 116 children of school age are reported, but the Bureau is not able to help them. Two schools are needed upon Prince William Sound. There should be a larger building and an additional teacher at Douglas City. Another teacher is needed in Juneau, and at other places buildings and teachers are needed. It is again earnestly recommended that \$60,000 be appropriated for the industrial and elementary education of these Alaskan children. It is recommended also that there be coupled with the appropriation a proper compulsory school law. Such a law would have a very wholesome effect upon a large number of natives who are indifferent about sending their children to school. Where these children come regularly their progress is highly satisfactory.

MISSIONS STATIONS.

Section 7 of the organic act provides—

That the land, not exceeding 640 acres at any station, now occupied as missionary stations among the Indian tribes in said section, with the improvements thereon erected by or for such societies, shall be continued in the occupancy of the several religious societies to which said missionary stations respectively belong until action by Congress.

This was in 1884. The act of March 3, 1891, provides:

And all tracts of land, not exceeding 640 acres in any one tract, now occupied as missionary stations in said district of Alaska are hereby excepted from the operations of the last three preceding sections of this act.

Such action was followed by Congress in Oregon and Washington. It would be a great relief to the various societies if Congress would at once invest them with fee simple titles to these stations. At present in some places they are annoyed and hampered and put to expense and great uncertainty for want of proper title.

LEGAL STATUS OF THE NATIVES.

The third article of the treaty with Russia provides that—

The uncivilized tribes will be subject to such laws and regulations as the United States may from time to time adopt in regard to the aboriginal tribes of that country.

If we attempt to classify into civilized and uncivilized we at once enter difficulties. In the first place, these native people are not Indians as the Sioux and other tribes of the plains. They are self-supporting, industrious people. Morally and religiously they were in deep degradation, but the different missionary societies have sent them doctors and teachers and ministers, and the sum total of these efforts is marvelous. The people are now in a transition state, ready to abandon old customs and ideas and take up American customs and ways of living. The young men are asking to be licensed as engineers and pilots; to be allowed to locate land and mining claims. The just way, and the way which will involve least difficulty, is for Congress to declare them citizens, and that they "shall be admitted to the enjoyment of all the rights, advantages, and immunities as citizens of the United States, and shall be maintained and protected in the free enjoyment of their liberty, property, and religion." All then will be subject to the same law. If the leading men of the Thlingits, Hydahs, and Tsimshians could be invited to a convention to be held at Sitka for one week, the judge, United States district attorney, the governor, and other United States officials, and many prominent citizens could address them. Such a gathering would influence them greatly. If this suggestion meets with approval, it is recommended that the Secretary of the Interior ask Congress that \$1,500 be allowed to pay the necessary expenses.

ALASKA A LIGHT-HOUSE DISTRICT.

The Thirteenth district extends from the boundary between California and Oregon to the northern boundary of the United States, and includes Alaska. The tender visits southeastern Alaska once a year for a few days to look after what few buoys have been placed. Commerce has grown so rapidly and there are now so many millions of dollars invested in steamships plying in these waters that the time has come to separate Alaska into a light-house district. There is work enough to keep an inspector and tender busy. British Columbia is far surpassing us in this particular. Soon they will have completed four new lights at important points upon the inside passage. We should have as many now in operation between Tongas and Skagway.

COAL.

There is coal in different parts of the district. On this subject readers are referred to the United States Geological Survey Report on coal and lignite of Alaska, by William Healy Dall. This past season practical experts have been examining the region east of Prince Williams Sound, where a large area has been located. Mr. Charles Wells, of Juneau, a coal miner from Pennsylvania before coming to Alaska, is developing a vein at Murderers Cove, on the south end of Admiralty Island. Fuel upon the Yukon for 100 steamboats and for miners' camps and other purposes is a very important matter. Some of the companies are paying attention to this subject, and have begun to dig upon the places where coal appears on the Yukon and Tananna. The laws

relating to coal lands should be extended and every encouragement possible given to those who are willing to invest and open up this resource. As long as coal is king in the Navy it would be prudent on the part of our Government to know how available Alaska is for supplying coal.

PETROLEUM.

This comes to the surface on the main land across from Kadiak Island. Its existence has been known for years, but no attention was given to it until two years ago. Some people in Seattle have taken up the matter and have men skilled in the business making examinations. The quality of the article is reported to be all that could be desired when compared with what is produced elsewhere.

ALASKA'S FIRST RAILWAY.

At Unga, Berners Bay, and Douglas Island there are railways, but these are for the use of the mines.

After the approval of the act of May 14, 1898, granting the right of way, the first company to make a filing was the Pacific and Arctic Railway and Navigation Company. They went to work with a will to overcome all obstacles. The corps of engineers are young men who have had practical experience in railroad construction in other parts of the United States. Nothing has been done in a cheap and makeshift sort of way. The roadbed, bridges, ties, rails, all show that money has not been spared and that the best things have been aimed at.

It is a great surprise to the miners who are now returning from Dawson to step on a train drawn by a locomotive for 14 miles over ground where many of them labored and toiled for weeks in the summer and fall of 1897; where some of them lost their animals and outfits, and in sheer desperation sat down and cried.

The company now contract to deliver goods at the lakes. Pack trains are used from the end of the road.

SKAGWAY.

Here is a true American town, only a little over a year old, with a railway, waterworks, electric lights, four wharfs, lumber yards, hotels, and shops of all kinds, with one daily and one weekly newspaper. The town is well laid out and a vast amount of work has been done in clearing the ground and in building. It wears an air of permanency, for already a great many families are settled there.

At the first rush the bunco men and gamblers and prostitutes got in and became organized, and controlled matters pretty much their own way, and intimidated three United States deputy marshals. Matters came to a head early in July, when a returning Klondiker was robbed of his dust in open day. The people were aroused, and they determined to endure it no longer. While many of the law-abiding citizens were assembled and considering plans of action the leader of the lawless element undertook to pass the guard which had been stationed at the approach to the wharf. He was armed with a Winchester rifle loaded with explosive balls. When halted he became violent and pointed his gun to shoot. In the few seconds Frank Reid, the town surveyor, was shot through the groin and hip bone by the explosive charge from Jeff. R. Smith's Winchester, and Smith fell dead with a bullet through

his heart. This made the citizens determined. The United States commissioner was sent for and committees rounded up the lawbreakers before him. Among the rest was S. S. Taylor, the United States deputy marshal, complained of for willful neglect of his official duty by neglecting and failing to serve the warrant of arrest issued and placed in his hands against the three men who had robbed the Klondike miner. While some were in favor of lynching, counsel from men of sober judgment prevailed, and there was no hanging. Some whose company was no longer agreeable were given free transportation out of the country, and eleven were turned over to the United States marshal to await the action of the grand jury, which will meet about the middle of November. This was a self-purification. Skagway and Dyea are now models of good order.

The pay of a deputy United States marshal is \$750 and his fees. Ordinary workmen were obtaining from \$3 to \$5 per day. The amount of the salary and fees is so small and the price of living so great that the temptation to receive money from smugglers, gamblers, and prostitutes has been strong, and when once money was taken it would not be long until blackmail was regularly demanded.

THE FEE SYSTEM.

The clerk, the United States commissioner, and the deputy marshals receive part of their compensation in fees. The system is essentially wrong and should be abolished. Judged from its evil working in Alaska, it is worthy everywhere to be anathematized.

If the Government wants good and capable men in these offices, there is but one right method, and that is to pay a good, liberal salary to each officer and no fees whatever. If a fee is justly due for the service rendered by the officer, let it be collected and turned into the United States Treasury. We beseech Congress to give this matter consideration and free us from this vicious system.

TRANSPORTATION.

The officers placed here to execute the law are tied hand and foot. They have no certain and independent means of transportation. They can not go afoot, neither can horses be used, as in Arizona or New Mexico. Rowboats and sailing vessels are too slow and dangerous.

As stated above, the inspectors of fisheries need a steam vessel entirely to themselves. The United States marshal and his deputies are the executive officers of the court and the peace officers of the communities. When the number of canneries and employees in them, and their isolation, and the numerous mining camps along the coast are considered, it can be well understood why the marshal should be furnished with a fast and thoroughly equipped steam vessel. She should be furnished with a Gatling gun and the best of small arms. The officers and crew of this vessel should be sworn in as special deputies to the marshal. This will enable him to reach any point with dispatch, and carry out the orders of the court, make arrests in out-of-the-way places, transport prisoners, etc.

If Alaska, as recommended, is organized into a light-house district, a proper tender will be needed. Then a vessel for the governor and other officials should be furnished and placed under the direction of the governor. He is the officer who has most to do, and can accomplish most with the natives. They are in a state of change from their

old customs in reference to witchcraft, marriage, the laws and rights of property, relation, etc. They should be sharply looked after, and protected and punished whenever justice so requires.

The requirements of the revenue are so imperative that the Treasury Department will hardly allow the district to go any longer without a proper revenue cutter. It is estimated that four steam vessels for service as above indicated would cost \$300,000, and money could not be more wisely spent in behalf of Alaska.

EMERGENCY FUND.

There is not a dollar outside of the regular appropriations which can be spent for anything extraordinary. It would have been creditable for Alaska to be represented at the Omaha Exposition, but there was not a cent that could be used for such a purpose. If a whole town should be consumed by fire, or a vessel's crew thrown upon the beach, there is no fund that could be drawn upon for immediate relief. If the sources of revenue as suggested above are drawn upon, it is recommended that Congress ordain that at least 10 per cent of the amount collected shall be set aside as an emergency fund for Alaska, to be drawn upon by the governor of this district for such extraordinary expenses as shall meet the approval of the Secretary of the Interior. The executive arm finds that the lack of such a fund is a great weakness in governing such a territory as Alaska.

POSTAL FACILITIES AND TELEGRAPHIC COMMUNICATION.

The Post-Office Department sent a commissioner here to straighten out matters in reference to the mails, and he did good work. It is a difficult thing for the Department to let the contracts to proper parties and to see that service is rendered accordingly. All feel grateful for what has been done. Men in these far-off camps become anxious and stirred up to a great expectancy when a mail is due. Some pay large sums to have their letters cared for and forwarded. The service from Sitka to Unalaska should be made monthly throughout the year. There will be a large number of men in Prince William Sound, Cooks Inlet, Unga, and other places who will not get any mail for five months. It would make them happier if they could have outside communication monthly.

The Government should no longer leave Alaska without cable connection, whether the cable can be made to pay or not. If private corporations are willing to undertake this work, they should be generously encouraged by Congressional action. It would make a vast difference in governing Alaska if Sitka were connected with Washington by telegraph.

CONCLUSION.

There is no desire to discuss in this report the features of the bill which passed the Senate and is known as the Carter bill. The fact that it was framed and offered as a law shows that much interest in Alaska. As the war with Spain and the legislation growing out of it so engrossed the time and attention of Congress, many friends of Alaska advised the House Territorial Committee to defer action upon it until the coming session. In the meanwhile many of our citizens have been counseling together and pondering over the proposed measures. They will

present to Congress their views, and no doubt they will have great weight. We know that the session is a short one, and the results of the war are momentous, and that they will demand serious discussion, but we plead that Congress may remember that Alaska is thirteen times larger than Cuba, that it has been in our possession for thirty-one years, and that its value has been unknown and unappreciated. In the light of the recent discoveries, who will be so bold as to assert that any square mile of Alaska is a worthless possession? It was once called Seward's folly, but now his wisdom is honored. Above all, we beseech Congress to regard us as American citizens, and not undertake to classify us with Kanakas, Filipinos, and Cubans, and as worthy of a long state of probation before the full measure and blessing of the laws can be extended to us.

Very respectfully,

JOHN G. BRADY,
Governor of Alaska.

The SECRETARY OF THE INTERIOR,
Washington, D. C.

APPENDIX A.

SITKA, ALASKA, *September 28, 1898.*

MY DEAR SIR: Herewith I have the honor to submit such data as is at present available, which may be of some assistance to you in forming an estimate of the needs of this office.

I need not remind you of a fact with which you are already familiar, viz, that since the close of the fiscal year ending June 30, 1897, owing to the great and unprecedented influx of strangers into this district, the business of the court has probably quadrupled. There are now pending before the United States district court of Alaska 132 cases (criminal) where indictments have already been found. There are 33 cases pending where defendants have been held by United States commissioners to await the action of the grand jury. There are probably 150 cases, persons in the district openly engaged in selling intoxicating liquors in violation of law. These, as well as numerous other miscellaneous cases, will have to be presented to the grand jury for its consideration and action. There are some sixty prisoners, on an average, confined in the jail all the time at Sitka, a portion of them awaiting trial, others serving out sentences for petty offenses. In many instances liberation is attempted through the medium of habeas corpus. All of the cases, as a matter of course, demand the personal attention and time of the district attorney. There are five civil actions pending in the district court and circuit court of appeals in which the Government is a party, and one appeal to the Supreme Court of the United States.

An examination of the report of the Attorney-General for the year 1897 will show that in the following districts, viz, Connecticut, Delaware, District of Columbia, Idaho, Massachusetts, Missouri (eastern district), Montana, Nevada, Rhode Island, South Carolina, Tennessee (eastern district), Tennessee (middle district), Tennessee (western district), Utah, Vermont, and Wyoming there were pending on June 30, 1897, only 135 cases on the criminal calendar, 16 districts, which in the aggregate have but two more cases pending for trial and disposition than the district of Alaska.

To do the business for the 16 districts above mentioned there are 16 district attorneys, 18 assistant district attorneys, and 16 clerks, in all 50 persons, while in Alaska 2 persons must attend to all the business in which the Government is interested (the district attorney and his one assistant), whose compensation is but \$50 per month, and who reside 300 miles from the main office.

While there may possibly be some small inaccuracies in the foregoing statement, an examination will prove it to be substantially correct. The needs of this office, from the foregoing, are apparent.

There should be, at least, a clerk in my office at Sitka, and, owing to the vast area of territory contained in the district, one assistant at the following places: Juneau, Wrangell, Skagway, St. Michaels, and Circle City. Owing to climatic conditions and the lack of facilities for travel, such a distribution seems absolutely essential.

There should also be an available fund from which to pay the expenses of a special agent to locate the places, get the names, where and by whom liquor is being sold; also to get the names of witnesses who will furnish proper proof.

It is impracticable for this office to procure the names of places and persons without adopting some method of this character.

As the cost of living in this Territory is from 25 to 100 per cent higher than in the States, the salaries of officials and employees ought to be such as would command competent persons.

Very respectfully,

Hon. JOHN G. BRADY,
Governor of Alaska.

ROBERT A. FRIEDRICH,
United States Attorney.

APPENDIX B.

THE DALTON TRAIL.

The Dalton trail commences from the Dalton Post, situate on the north side of Pyramid Harbor, at the head of navigation of the Chilkat Inlet, and about 80 miles northwest of Juneau. After leaving the post the trail leads along the west shore of Chilkat Inlet for about 4 miles, when it enters a beautiful meadow which extends for several miles along the west bank of the Chilkat. The Kalsekahin River is crossed about 9 miles from the post, where the trail detours from the main river and enters the high ground along the foot of the range reentering the level country about a half mile before arriving at the tollhouse, situate on the east bank of the Takhin River, a distance of thirteen miles from the post at the harbor. A very good bridge spans the main channel of the Takhin River, and as the other channels are narrow and shallow there is no trouble in crossing this stream even for foot travelers. Between the tollhouse and the post at the harbor there has been considerable money expended in corduroying the swampy places, removing the dense underbrush, and grading the uneven ground, sufficiently wide for a wagon road. Proceeding from the tollhouse the route trends in a general northwesterly direction along the crest of a low ridgelying midway between the Chilkat River and a beautiful lake of the same name.

At a point about 18 miles from the harbor post the trail comes out into a small clearing at the very edge of a high bluff overlooking the Chilkat River Valley, from which vantage ground the scenery is most beautiful, as the valley, with its numerous river channels, islands, and level meadows, can be viewed up and down for a distance of at least 20 miles. At a distance of 23 miles the Chilkat Valley is again entered, and the trail proceeds over a level country until the banks of the Takhin River are reached, 25 miles from the post. This stretch of 12 miles from the tollhouse to the Takhin River has been well constructed, for, as the country is densely timbered and quite rough in places, it required a great deal of labor to clear the way and to excavate the rock and earth in establishing an easy grade for riding horses and pack animals. There have been also a number of extensive bridges across the small streams constructed on this section of the trail. After striking the Takhin River it was found necessary to do considerable heavy grading along the south bank of the river for a distance of over a mile to the crossing of Clear Water, which forms the outlet of Chilkat Lake.

The trail from this point extends over the river bottom in a diagonal direction for a distance of about $1\frac{1}{4}$ miles to near the confluence of Trout Creek, which latter stream is crossed at a point about 29 miles from the harbor post. At this point it is a good place to camp, as an extensive meadow borders the creek on the west side for several miles. Proceeding on our way, the trail skirts along the east bank of Trout Creek for a short distance, and then, passing over a low ridge, comes out on the banks of the Clahena River 31 miles from the post. The trail from Trout Creek to the latter river has been well constructed, considerable corduroy being used, and several bridges span the small streams and miry places. From where the river is first encountered the path has been constructed for a distance of 4 miles along the south bank of the stream at considerable expense, as in many places the banks are quite abrupt and required considerable excavating. Thirty-five miles from the post the Clahena River is crossed at a point where there are numerous channels on the river bottom, and consequently none of the streams are very large or difficult to cross. After the trail crosses the Clahena the route borders the north bank of the stream for a distance of 2 miles to Boulder Creek, which is another fine location for a camping ground, as the site is well supplied with an abundance of good, clear water, fine timber, and considerable grass for animals.

In this vicinity quartz croppings are quite numerous, and there seems to be many geological reasons for concluding that this locality is on the direct line of the quartz mineral belt, known as the mother lode of Alaska. From Boulder Creek to the

international boundary line between British Columbia and the territory of the United States, the trail has been graded along the foot of the range, a short distance from the river, and good work has been done on this section. At the boundary line, or at least where the boundary line is supposed to be, the route taken is over a rather steep hillside, which is well graded for a distance of about 5 miles to Pleasant Camp, the second post on the Dalton trail, established by the promoters of the route. This camp is now quite an important place, as it is the headquarters for the Canadian police and a convenient trading post for the numerous prospectors now in that vicinity and the many natives living in the neighborhood. The distance from the harbor post to Pleasant Camp is about 45 miles. The route has been well selected over the best ground, and the work done in a good and substantial manner.

In conclusion, I would say that this route into the interior of Alaska, British Columbia, and the Northwest Territory has been extensively traveled in the past two years, and is considered by far the best and, in fact, the only practical land route into the new and extensive gold fields of the Upper Yukon.

There has been a large amount of money and labor expended on the construction, made necessary by the nature of the country which the trail passes through and the necessity of establishing easy grades for pack animals and for driving stock over.

The promoters deserve great credit for the manner in which this route has been constructed, and it is also a great public benefit for all those who are interested in the interior mines, as it furnishes an easy way of ingress into the vast regions of the now famous Yukon watershed, where mining towns and cities are coming into existence, and where an army of men is directing its energy and ambition in the effort to grasp its wealth.

Very respectfully,

G. W. GARSIDE, *Mining Engineer.*

JUNEAU, ALASKA, October 6, 1898.

APPENDIX C.

Alaska publications within the district of Alaska.

Dyea.—The Dyea Press.

Skagway.—Skagway News; The Daily Alaskan.

Juneau.—The Alaskan Miner; Alaska Mining Record.

Wrangell.—Fort Wrangell News; The Stickeen River Journal.

Sitka.—The Alaskan.

REPORT OF THE GOVERNOR OF ARIZONA.

EXECUTIVE DEPARTMENT OF ARIZONA,
Phoenix, Ariz., August 31, 1898.

I have the honor to submit the following report of the affairs, development, and progress of Arizona for the year ended June 30, 1898, which I deem it proper to report fully upon the general condition of territorial affairs, in addition to the changes and progress made within the year:

POPULATION.

A complete census has been taken since 1890. The population has increased very rapidly within the last eight years, and it is believed that the Territory has now nearly, if not quite, 100,000 people.

The class of immigration to the Territory insures a high grade of citizenship. The great and varied resources of Arizona invite strong, energetic characters, who come seeking investments and permanent homes. Social and moral conditions here compare favorably with any portion of the Union. Our citizens are true, honest Americans, deeply loyal and patriotic. They enjoy the proud distinction of being the first to respond to their country's call for volunteers for the war just closed. Arizona very promptly tendered to the Government volunteers that, compared with our population, in numbers far exceeded the numbers made by any other State or Territory. On Cuban soil, by their bravery and heroic conduct, they won the admiration of all men. An Arizona flag was first hoisted over the ramparts of the enemy at El Caney, and many of the Territory's noble heroes died with their blood an undying claim upon their country's gratitude.

Their names and deeds will invoke love and respect as long as the nation's history lives.

Arizona's people, by their patriotism and valor, by their thrift and industry, by their loyalty to the Republic, fealty to national principles, and every consideration of true Americanism, have earned and won the inestimable privilege of self-government. They all ask that which ought to be granted—the admission of the Territory into the Union as a State, without longer delay.

TAXABLE PROPERTY OF THE TERRITORY OF ARIZONA.

The following is an exact statement, in tabulated form, of the taxable property of the Territory of Arizona, according to the assessment rolls made by the report of the territorial board of equalization, for the current year. The figures are taken from official records and are reliable, but

assessments are very low on account of the unwise system of low valuations and high rates which prevails in the Territory.

County.	Land.	Value.	Value of improvements.	Value of city and town lots.	Value of improvements.
	<i>Acres.</i>				
Apache.....	862,842.57	\$258,278.95	\$36,924.00	\$15,677.00	\$45,067.00
Cochise.....	116,921.87	115,519.00	73,990.00	25,964.00	359,083.00
Coconino.....	698,883.59	237,388.88	17,167.41	136,628.67	190,542.00
Graham.....	38,696.80	378,231.00	286,499.70	32,103.40	134,956.80
Gila.....	5,051	152,075.00	9,825.00	59,537.50	102,895.00
Maricopa.....	248,322	3,311,812.00	495,973.00	3,468,052.00	1,195,206.00
Mohave.....	6,997.13	24,630.17	138,029.71	35,303.00	88,975.00
Navajo.....	1,036,429	260,800.50	35,216.00	73,037.83	140,940.00
Pima.....	187,594	243,749.00	170,397.00	552,810.00	897,200.00
Pinal.....	62,719.80	386,192.00	208,673.54	50,251.30	55,540.00
Yavapai.....	895,412.91	540,286.21	104,750.00	872,550.50	506,393.00
Yuma.....	75,936	223,895.00	9,535.00	53,972.00	62,255.00
Total.....	3,733,150.86	5,825,506.71	1,596,950.36	3,875,915.20	3,838,552.80

County.	Horses.		Mules.		Asses.	
	Number.	Value.	Number.	Value.	Number.	Value.
Apache.....	2,493	\$43,032.00	42	\$1,055.00	134	\$680.00
Cochise.....	4,001	56,904.00	164	3,211.00	206	988.00
Coconino.....	3,068	82,911.00	21	960.00	39	175.50
Graham.....	3,608	72,160.00	197	3,993.80	895	3,633.00
Gila.....	3,048	46,315.00	119	2,553.00	257	1,268.00
Maricopa.....	4,458	105,337.00	212	5,312.00	31	185.00
Mohave.....	2,377	70,205.00	27	595.00	88	440.00
Navajo.....	2,414	46,529.00	39	1,060.00	73	452.00
Pima.....	5,372	73,182.00	319	7,700.00	51	376.00
Pinal.....	2,067	30,855.00	85	1,560.00	50	207.00
Yavapai.....	6,403	109,496.00	82	2,015.00	220	2,104.00
Yuma.....	434	6,186.00	58	1,015.00	6	30.00
Total.....	40,188	723,112.00	1,365	31,029.80	1,550	10,498.50

County.	Cattle.		Sheep.		Goats.	
	Number.	Value.	Number.	Value.	Number.	Value.
Apache.....	8,308	\$93,181.00	75,024	\$150,048.00	824	\$1,648.00
Cochise.....	64,063	656,645.75	6,330	12,660.00	1,362	2,724.00
Coconino.....	18,794	192,638.50	183,750	367,500.00	105	210.00
Graham.....	64,825	655,200.00	1,016	2,032.00	2,455	4,910.00
Gila.....	42,757	427,786.00	5	10.00	4,484	8,968.00
Maricopa.....	24,213	308,254.00	8,539	17,078.00	1,052	2,104.00
Mohave.....	25,705	257,050.00	6,800	13,600.00	500	1,000.00
Navajo.....	8,022	96,264.00	86,022	172,044.00	517	1,034.00
Pima.....	56,781	573,160.00	2,815	5,630.00	152	304.00
Pinal.....	26,274	328,415.00	4,300	8,600.00	.....	.....
Yavapai.....	56,661	571,355.00	25,367	50,734.00	3,117	6,234.00
Yuma.....	837	8,370.00	.....	.....	.....	.....
Total.....	397,240	4,158,364.25	399,968	799,336.00	14,568	29,136.00

County.	Swine.		All other property.	Railroads.		Total valuation.
	Number.	Value.		Miles.	Value.	
Apache.....	300	\$605.50	\$100,413.85	54.482	\$272,410.00	\$1,019,000.30
Cochise.....	61	451.00	542,348.00	175.55	937,243.50	2,787,761.25
Coconino.....	209	686.50	401,371.22	118.06	539,330.00	2,147,507.68
Graham.....	482	1,299.50	567,204.85	41	123,606.00	2,265,870.65
Gila.....	450	1,317.50	355,891.00	.....	.....	1,167,891.00
Maricopa.....	5,505	18,762.50	795,478.63	97	456,331.37	9,174,865.50
Mohave.....	87	315.00	136,659.00	108.076	540,380.00	1,307,181.88
Navajo.....	276	1,297.25	119,346.85	57.908	286,040.00	1,234,061.43
Pima.....	534	1,862.00	649,553.00	117	577,817.00	3,753,240.00
Pinal.....	187	561.00	82,706.00	79.79	476,222.45	2,629,783.29
Yavapai.....	743	1,857.50	1,848,912.18	60.553	306,760.00	3,979,247.37
Yuma.....	363	1,089.00	138,062.76	82.50	502,539.85	1,006,949.61
Total.....	9,097	24,604.25	5,237,947.32	989.568	5,014,680.77	31,473,359.99

* Includes patented mines.

According to the foregoing table, the Territory has the following assessed taxable property:

3,733,150.86 acres of taxable land	\$5,825,566.71
Improvements thereon	1,586,950.36
City and town lots	3,875,915.20
Improvements thereon	3,838,552.80
40,183 horses	723,112.00
1,365 mules	31,029.80
1,550 asses	10,498.50
397,240 cattle	4,158,364.25
399,968 sheep	799,936.00
14,568 goats	29,136.00
9,097 swine	24,604.25
989,568 miles railroad	5,014,680.77
All other property	5,237,947.32
Total	31,473,359.96

The average valuation is:

Land, per acre	\$1.56
Horses, per head	18.24
Mules, per head	22.73
Cattle, per head	10.41
Goats, per head	2.00
Hogs, per head	2.70
Asses, per head	6.77
Sheep, per head	2.00
Railroads, per mile	5,071.02

It will be seen from the above recapitulation that values are very low. The valuation of the personal and other property not stated is correspondingly low, which, when considered in connection with the fact that a considerable portion of the property of Arizona escapes assessment altogether, accounts for the apparent anomaly of conditions in reference to the wealth, debt, and taxes of the Territory.

The rate of taxation differs in the different counties, but the average rate throughout Arizona for all purposes is about \$3.50 on \$100, 80 cents of which, this year, is for Territorial purposes solely. Earnest effort will be made to induce the next Territorial legislature, which will convene in January, 1899, to so revise the revenue laws in reference to the assessment and collection of taxes as to substantially correct the faults referred to.

Statement of the bonded and floating debt of the Territory July 1, 1898.

Title of bonds.	Date of issue.	Time.	Rate.	Amount.
		<i>Years.</i>	<i>Per ct.</i>	
Insane Asylum	July 1, 1885	20	7	\$90,000.00
Wagon Road and Bridge	Nov. 1, 1885	15	8	12,000.00
Gila Bridge	May 15, 1885	15	8	15,000.00
Arizona University	Jan. 1, 1887	20	7	14,000.00
World's Fair	July 1, 1892	20	5	30,000.00
Territorial funding	Jan. 15, 1888	25	6	150,000.00
Do	July 15, 1892	50	5	2,000,000.00
Do	Jan. 15, 1896	50	5	68,000.00
Total				2,379,000.00
Floating debt (warrants)				251,288.44
Total				2,630,288.44
Deduct county and city funded debt of Territory				1,633,027.57
Aggregate Territorial indebtedness				997,260.87
Less cash on hand				123,861.24
Net debt of Territory				873,399.63

To the citizens of Eastern States who are unacquainted with conditions here the above statement of indebtedness will probably appear excessive, especially when compared with the amount of assessable property listed; but with an assessed valuation of upward of \$100,000,000, to which we would be justly entitled if our property were assessed and valued according to Eastern systems, our debt would be very light.

It is intended to fund the floating debt into low interest-bearing bonds, and remove all necessity for a floating debt by a sufficient tax levy each year to provide for all expenses of government.

CUSTOMS.

Following is a statement by the collector of customs, port of Nogales, of the business of the district of Arizona for the current year:

Statement of imports into the district of Arizona during the fiscal years ending June 30, 1897, and June 30, 1898, respectively.

CONSUMPTION.

When imported.	Free.	Dutiable.	Total imports.	Duties collected.
1897.				
July	\$122,897.00	\$12,806.00	\$135,203.00	\$3,957.11
August	194,981.00	4,066.00	199,049.00	1,841.39
September	181,778.00	1,425.00	183,203.00	475.57
October	215,229.00	13,821.35	229,050.35	5,573.88
November	209,731.00	55,270.00	265,001.00	32,488.63
December	370,582.00	38,599.00	409,181.00	24,450.00
1898.				
January	390,637.00	42,907.00	433,544.00	19,688.00
February	272,757.00	14,924.00	287,681.00	6,186.98
March	756,367.00	19,401.00	775,768.00	8,898.24
April	893,180.00	86,187.00	979,367.00	16,945.48
May	146,313.00	37,721.00	184,034.00	14,621.78
June	177,776.00	6,107.00	183,883.00	2,567.00
Total 1897-98	3,412,230.00	282,734.35	3,714,964.35	137,655.46
Total 1896-97	2,427,292.00	620,472.00	3,047,764.00	126,000.16
Increase	1,004,938.00		667,200.00	11,655.31
Decrease		337,737.65		
Additional duties pertaining to above months				667.58
Total increase in duties collected				12,322.84

WAREHOUSE AND IMMEDIATE TRANSPORTATION.

When imported.	Values.	Duties.
1897.		
July	\$40,237.00	\$6,361.25
August	37,426.00	13,952.21
September	25,291.00	6,033.98
October	27,851.00	9,631.99
November	33,797.00	7,837.02
December	98,444.00	14,693.92
1898.		
January	51,675.00	12,926.80
February	58,138.00	17,242.23
March	43,259.00	14,965.94
April	51,275.00	15,348.76
May	211,484.00	74,366.00
June	124,851.00	52,341.70
Totals 1897-98	803,728.00	245,702.18
Totals 1896-97	1,005,128.00	91,434.56
Increase		154,267.62
Decrease	201,400.00	

The port of Nogales being the port of first arrival for merchandise entering the district of Arizona in bond, this district should in all fairness be credited with the duties accruing in this branch of the service, for practically all the work involved in attending to these importations is done at Nogales, although the duties are paid at the several ports of destination.

Thus, the district of Arizona may justly claim the following as the business transacted therein during the past fiscal year: Total imports, \$4,518,692.35; duties, \$384,025.12.

Comparative statement of percentage of dutiable and free importations for consumption and the average rate of duty collected on dutiable merchandise.

Year.	Imports.	Dutiable.	Free of duty.	Average rate of duty collected.
1896-97	\$3,047,764.00	Per cent. 23	Per cent. 67	Per cent. 20.8
1897-98	8,714,964.35	7½	92½	48.7

Number of cattle imported, free and dutiable, with value of dutiable.

Year.	Imported.		Value of dutiable.
	Paying duty.	Free of duty.	
1896-97	Head. 87,461	Head. 12,749	\$542,649
1897-98	32,231	6,428	212,422
Decrease	55,230	6,321	330,227

Duties levied and collected on cattle.

Year.	Number of head.	Duties levied and collected.	Average duty per head.
1896-97	87,461	\$106,537.01	\$1.21½
1897-98	32,231	93,227.52	2.88½

Exports.

	Total value.
1897-98	\$1,188,381
1896-97	1,032,414
Increase	155,967

AGRICULTURE AND HORTICULTURE.

[A report by the acting director of the experiment station of the University of Arizona.]

Each year is adding largely to the agricultural and horticultural development of the Territory of Arizona. Although as yet a small percentage of the total area is under cultivation, when one takes into consideration the vast area of the Territory, the arable lands are by no means insignificant. I am unable from any available statistics to obtain authentic data as to the exact area of the counties under cultivation and in process of being reclaimed. Of the total area of the Territory, embracing some 22,500,000 acres, considerably less than one-half per cent is arable land. Of the arable lands more than one-fourth of a million acres are under canal irrigation at the present time, and with the canals in process of construction this area will soon be greatly augmented. The arable lands of the Territory are in the

aggregate greater than the total area of the smaller of the New England States, and a large portion of these lands will at no distant date come under cultivation.

When, in connection with this, we take into consideration the fact that under proper irrigation much more can be produced in a given time than on an equal area in a non-irrigated region, we begin to get some notion of the value of our agricultural lands.

The agricultural development in Arizona is rapidly giving stability to our present population, which is in marked contrast with the population of the Territory ten years or more ago. Our population is fast becoming communities of homes, and the nomadic miner is no longer the most important personage in our commonwealth. The diversity of soil and climate is so varied that a great variety of crops may be produced, varying from semitropical plants to plants usually grown in colder portions of the temperate zone.

Of the arable lands now under cultivation, approximately 280,000 acres are in Salt River Valley. This valley is of wide extent, practically level and perfectly situated for irrigating on a large scale from canals. Canals at Yuma and elsewhere are now in process of construction, which, when complete, will add materially to the agricultural interests of the Territory.

The live stock interests have been greatly improved during the past few years, largely through agricultural development. Until recently all cattle and other stock produced in the Territory were grazed upon our 35,000,000 to 40,000,000 acres of grazing lands and sold directly from the range. With the development of irrigation and the advent of mixed husbandry much of our stock is fattened on alfalfa, sorghum, and other products of the farm and placed upon the market at a greatly increased weight and at a higher price.

Swine are fattened on growing alfalfa in Salt River Valley and elsewhere in large numbers, a little grain being fed prior to marketing. Although Arizona is largely a grazing Territory with many millions of dollars invested in her stock, general farming or mixed husbandry is rapidly taking an important place and at no distant day will become the occupation of a majority of our population. During the period of agricultural development the poor methods employed in tilling the soil militate against the best success with agricultural and horticultural crops. With better cultivation and closer attention to the application of water in irrigation, larger and better crops will be realized. In most cases a smaller acreage with closer attention to time of planting and cultivating will produce better and more than a larger acreage when handled as it is at present.

Among the many agricultural and horticultural products, the following are worthy of consideration:

NEW CROPS.

THE SUGAR BEET.

Prof. A. J. McClatchie, who has charge of experimental work with sugar beets in Arizona at the present time, writes as follows:

"(1) Can sugar beets of good quality and satisfactory size be grown in the Salt River Valley? (2) At what time or times of the year should the seed be sown? (3) What methods of irrigation and culture should be followed in order to insure success? (4) At what approximate cost can sugar beets be raised under the conditions existing in the valley?"

"The first of these questions has already been answered in the affirmative. By acting director of the experiment station, arrangements were made with several ranchers for the use of a plat of land varying in size from one-eighth to three-fourths of an acre, and the supervision of the preparation of the soil, the seeding of the plats, and the entire subsequent care of them placed in my hands. The twelve plats have been prepared, seeded, thinned, irrigated, hoed, and cultivated in accordance with the latest known methods, and as a result all have produced beets of good quality, and on most of the plats the yield will be satisfactory. Although at this writing (July 4) the beets of some of the plats are not fully matured, yet the recent samples sent Professor Forbes for analysis show a sugar content of from 11.3 to 16.1 per cent, and a purity coefficient of 79.7 to 88, the average weight of the beets being about 1 pound.

"The second question has been partially answered, and work now contemplated ought to answer it quite fully. It has been found that good beets can be grown from seed sown in January, February, and the early part of March, and it is supposed that similar results will be found in the sowing of seed during July and August. One plat has already been seeded during July, and the plan is to seed others at intervals for two months.

"Much has been determined as to the best methods of irrigation and culture for this region, by the work already done, and it is anticipated that much more will be learned from the experiments planned for the remaining months of the year.

"Upon the small plats grown thus far it has not been practicable to obtain much data bearing upon the fourth question. But through the cooperation of the Arizona Improvement Company, arrangements have been made for raising 3 acres of beets in one plat at a comparatively small expense to the experiment station. The plan is to keep a careful account of the labor expended upon this plat, and also a record of the amount of water used in irrigating it, that the approximate cost of growing beets in this valley may be determined.

"The work done by the experiment station this year ought to result in the establishment of an industry that will be a great benefit not only to the Salt River Valley but to the entire Territory."

SUPPLEMENTAL REPORT ON SUGAR BEET.

"As stated, the work with sugar beets this year has been on a small number of plats of larger area, under the care of an expert in beet culture and in the most favorable situations that could be found. The variety of beets planted in nearly all cases is the Klein Wanslebener, which was found last year to give best results; and, furthermore, the work has been concentrated in the vicinity of Phoenix and Tempe, Ariz. The results, as were expected, are much better by reason of these precautions, as is shown in the following table. This table, among other data, gives the results of analyses made within the space of about a month during the latter part of July and first part of August, at which time the beets seem most generally mature. When we remember that the ideal sugar beet weighs about $1\frac{1}{2}$ pounds, contains not less than 12 per cent of sugar and has a purity of not less than 80, it will at once be seen that the above results are, in most instances, of eminently high character. In but one case does the percentage of sugar in the beet fall below 12 and in but few cases does the purity fall seriously below 80. In some cases the results are remarkably excellent. For instance, the analysis of beets from the Indian school, near Phoenix, weighing 17 ounces, containing 14.8 per cent sugar in the beet with a purity of 89.1, is an unusually fine commercial article.

"These results, taken as a whole, are a vast improvement over those obtained last year and give us grounds for believing that the experiments will end in a favorable solution of the problem of sugar-beet agriculture in the Salt River Valley. The work is as yet by no means finished, but by the end of this year we will be able to state pretty certainly as to the feasibility of beet culture in this locality.

Grower.	Weight of beets.	Sugar in beets.	Purity.	Date of planting.	Date of analysis.	Soil.
	Ounces.	Per cent.		1898	1898	
Indian School, Phoenix.....	17	14.8	89.1	Feb. 21	July 19	Heavy clay.
Canaigre Ranch, Phoenix.....	11	14.7	85.3	Feb. 22	July 20	Sandy soil.
Do.....	14 $\frac{1}{2}$	13.3	82.2	do.....	Aug. 9	Heavy loam.
W. J. Murphy Ranch, Phoenix....	11 $\frac{1}{2}$	15.8	82.1	Feb. 24	July 23	Sandy loam.
Christy Ranch, Phoenix.....	17	14.2	78.7	do.....	July 27	Heavy loam.
Greer Ranch, Phoenix.....	15	11.1	75.5	Feb. 25	July 17	Sandy loam.
Fowler Bros. Ranch, Phoenix....	17 $\frac{1}{2}$	12.4	77.3	Mar. 1	July 9	Heavy clay.
Fowler Bros. Ranch, Phoenix, (earlier planting).....	18	15.2	75.5	Jan. —	Aug. 1	Clay.
F. A. Hough Ranch, Tempe.....	16 $\frac{1}{2}$	12.4	77.4	Mar. 14	Aug. 3	Heavy loam.
Experiment Station, Phoenix.....	20	13.4	83.8	Feb. 26	July 19	Heavy clay.
Do.....	17	12.3	78.8	Feb. 28	do.....	Sandy.
Do.....	10 $\frac{1}{2}$	12.5	80.9	Mar. 24	do.....	Do.
Tucson Plat.....	13	14.1	80.0	Jan. —	July 30	Clay loam.

CANAIGRE.

Prof. R. H. Forbes writes as follows in relation to Canaigre:

"Canaigre, known to botanists as *Rumex hymenosepalus*, is a native of the arid southwestern part of the United States and adjacent Mexico. In this region it has long been known and used by the Indians and the Mexicans for the purpose of tanning leather and to some extent also medicinally. At various times within the past twenty years casual attention had been given to this plant by various collectors and chemists, but it was not until 1891 that the Arizona Experiment Station began the work of its investigation in real earnest. The publications issued by this station at various times resulted in attracting commercial attention to the plant. Various experiments of a commercial nature established its usefulness for the purpose of tanning various grades of leather. It is of special value in connection with cheaper tannages, such as hemlock, for the purpose of giving weight, pliability, and toughness to the leather. It is capable of producing special grades of leather of particular excellence, such as enameled, patent, dashboard, and high-grade upper leathers.

"Viewed as a commercial proposition, canaigre is certainly attractive. Tannic acid, upon which the production of leather depends, is obtained from the barks of various kinds of trees, especially chestnut, oak, and hemlock. These forests, once destroyed, require many years for replacement, if in fact they are ever allowed to grow again. Canaigre, however, is an annual or biennial crop, so that tannic acid, which as a staple should rank almost with meat, flour, or iron, should be produced by agricultural methods quite as immediately remunerative as those employed in the production of other staples. The green root contains from 8 to 12 per cent tannic acid, which is 25 to 35 per cent in the dry material. The plant is a winter grower, and on this account should result in the irrigation of great areas in the arid southwest hitherto unreclaimed. This is because water for irrigation is much more abundant in winter than in summer.

"This is a crop which is particularly suited for operations on a large scale, it being possible to manage it almost entirely by machinery. For this reason it is likely that it will be controlled by large companies owning extensive tracts of land, extract factories, and, possibly, tanneries also.

"Various commercial ventures have been made with this plant up to the present time. The Anglo-American Canaigre Company has about 2,300 acres near Tempe, Ariz.; various companies have about 2,000 acres in southern California; a large enterprise is just beginning operations in central New Mexico, and various other experimental plantations have been started in Virginia, Florida, Texas, Sandwich Islands, Italy, and elsewhere. As a result of these ventures up to date, it has been pretty clearly demonstrated how to manage the crop, and the confidence with which the companies are proceeding with their operations augurs well for the commercial future of this industry."

THE DATE PALM.

Several years ago the Department of Agriculture imported and distributed to various localities in the arid regions of the Southwest a number of date palms. The palms were from the date centers of the Old World, and were supposed to be sucklings from trees of recognized merit. Nine of these imported palms are now growing at the experimental station farm at Phoenix, some of them measuring from 18 to 20 feet in height. Two are in fruit this year. Previously to this importation, seedling date palms were in bearing in Salt River Valley and other portions of southern Arizona for a number of years. A number of seedlings have produced fruit of fair quality, and as much as 300 pounds to the tree.

In no portion of the United States does the date palm do so well as in southern Arizona. In its native home the date palm is a tree of the desert, and by nature requires a high temperature for at least nine months of the year. It will withstand great digressions in temperature, and will come through the winter without serious harm where the temperature falls as low as 15° F. below freezing. Experience has already demonstrated that a climate fatal to the orange and lemon is not fatal to the date palm.

The growing of dates in Arizona is a new industry and has been described at considerable length in Bulletin No. 29, recently issued by the Arizona Experiment Station. Seedling dates have fruited in Arizona when but five years from seed and have produced from 200 to 300 pounds of fruit when seven years of age. Seeds planted in the garden or elsewhere, where there is sufficient moisture, will germinate and grow into trees without attention. From the results obtained in the growing of seedlings and in the imported dates at Phoenix, there is every prospect to believe that, with the importation of a number of approved varieties from which sucklings may be obtained, a new industry may be built up in southern Arizona which will be of vast importance to the Territory.

The value of dates imported in 1891 was \$661,596.41, and it is reasonable to expect that in time a considerable portion of the dates consumed in this country will be produced in the interior arid regions of the Southwest, of which southern Arizona is the center. The climatic and soil conditions of southern Arizona almost parallel the climatic and soil conditions of northern Africa. One fruit ranch in Salt River Valley has growing upon it at the present time more than 300 date palms. As yet, however, only a small percentage are in bearing. As these dates are all seedlings, it is likely but a small percentage will produce edible fruit. It is worthy the attention of the Government to make an importation of approved varieties of date palms for southern Arizona and in sufficient quantity to put this industry upon a substantial basis. It is to be regretted that growers are under the necessity of planting seedlings, when the chances are so remote that fruit of good quality will result.

SOME OTHER NEW CROPS.

In addition to the plants noted above, quite a number of varieties of economic plants heretofore not tested in Arizona have this year been grown on the grounds of the

experiment station. In the case of the most of these it is too early as yet to give the results. Cowpeas sowed March 14 grew well, and at the end of June are maturing a heavy crop of seed. Ninety-eight varieties of Russian melons were planted. At the end of June some of them are maturing, and several give promise of being valuable additions to the melons of Salt River Valley, the region being especially adapted to the growing of early melons. A Turkestan alfalfa, said to possess great drought-resisting powers, is being tested at the station.

Among the most promising of new forage plants are the Australian salt bushes, a species of *Atriplex*. A number of species of the same genus are indigenous to Arizona, and in many localities constitute much of the native forage. As yet these Australian plants have only been grown on small areas, but it has been demonstrated that they will thrive under very adverse conditions, and upon soil containing considerable saline matter. It has also been demonstrated experimentally that ramie, the well-known fiber plant, will grow well in Arizona.

Cotton has been grown, in a small way, for years in portions of Arizona. Some years ago the native population grew sufficient cotton to supply local demands, the product being manufactured into the coarser grades of cloth by the Mexicans. It has been well demonstrated that cotton will make a good crop in the irrigated portions of southern Arizona.

For many years the Mexicans have grown small patches of sugar cane near Tucson and Phoenix for their own consumption. H. W. Blaisdell, of the Yuma Light and Power Company, has recently been experimenting with a view to the culture of the cane on a large scale. A sample of his product, analyzed during the past year by the chemist of the experiment station, was found to contain 10.9 per cent of cane sugar, with a water content of 75.2 per cent. In both these figures the cane is about the same as the average article from Louisiana, which, from a recent report, appears to contain from 75 to 79 per cent of water and from 8 to 11 per cent of cane sugar.

Tobacco grows well in all parts of Arizona under irrigation. A number of wild species are indigenous to the Territory. It has been grown for many years by the Mexican population for local consumption. Growers obtain 12 to 12½ cents per pound for the cured product from local manufacturers, who make it up mostly for the Mexican trade.

Many varieties have been grown by the experiment station and for experimental purposes, manufactured into smoking tobacco and cigars. No thorough tests of methods of curing have as yet been made; however, it has been demonstrated that a good quality of both chewing and smoking tobacco may be grown in Arizona.

SOME STAPLE CROPS.

ALFALFA.

In no section of the United States does alfalfa make a better growth than in the irrigated portions of Arizona. Either green or cured as hay, the nutritive qualities of alfalfa are surpassed by few other plants. Domestic animals of all kinds relish, and, in many cases, become fat upon the dry hay alone, and cows kept upon it produce milk of good quality and in considerable quantity. Not only is it our most valuable pasture and hay-producing plant, but as a renovator and enricher of the soil it has no equal.

The long roots, which penetrate the soil to great depth, gather food elements from depths where no other plants of like nature penetrate, and as a gatherer of nitrogen it is not excelled. These food elements are stored in the plant, and as the plant decays are given up to succeeding crops. If sufficiently irrigated, alfalfa will produce a good growth upon any of our soils. Even high mesa soil, with hard, caliche subsoil a few inches from the surface, will produce several crops of hay in a single season when given sufficient water. As a pasture plant in southern Arizona it provides green food throughout the year. In most sections of the Territory two or three crops of hay are cut during the season, and the field pastured during the remainder of the year. In some instances five cuttings have been made from May to October. The cost of putting alfalfa hay into the stack is estimated from \$1.75 to \$2.25 per ton, while the total expense of the baled hay ready for market is estimated at \$4.50 per ton. As an illustration of the magnitude of the Arizona alfalfa crop from March 1, 1898, to June 1, 1898, 627 carloads of hay, much of which was alfalfa, was shipped from Salt River Valley to points outside the Territory over the M. and P. R. R. alone. This hay sold on board cars at Salt River Valley at from \$9 to \$10 per ton.

Many of the better hay ranches of southern Arizona are netting the farmers this year from \$20 to \$30 per acre.

Arizona's extensive alfalfa fields offer fine opportunities for the fattening of range stock, and the stockmen of the Territory have, during the past few years, taken advantage of the opportunities offered and have fattened thousands of cattle in the valleys, receiving substantial benefits, and at the same time adding a new and profitable source of income to the farmer.

WHEAT.

Each year is adding largely to the acreage and amount of wheat produced in Arizona. As it is largely a winter and spring crop, maturing before the extremely dry weather and corresponding scarcity of water, it is grown extensively in many portions of the Territory. Large flouring mills at Phoenix, Tempe, and Tucson are supplied by Arizona-grown wheat. On a single ranch in Maricopa County the past season some 2,000 acres were grown. Several experimental plots of foreign wheat were grown this year at the experiment station which yielded from 29 to 48 bushels per acre. The average yield for Maricopa County is estimated at from 20 to 30 bushels per acre.

BARLEY.

The large acreage of barley produced in Arizona is to considerable extent cut before maturity and made into hay. The yield per acre the past season has been from 1½ to 3 tons per acre. This hay has met a ready sale in the field, when baled, at from \$10 to \$11 per ton. The yield of grain per acre is from 30 to 50 bushels.

OATS.

Oats are only raised to a limited extent, and when grown are usually cut before maturity and made into hay. In the small valleys in northern Arizona the oat crop is of considerable importance, the yield frequently being 60 or more bushels to the acre.

CORN.

It is only within the past few years that it has been known that fine crops of corn may be grown in the warmer regions of Arizona. Large crops of this product are annually grown on the upper Gila, in Graham County, and the acreage in Maricopa County is annually increasing. In order that the grain may properly fill, corn must be planted in July, or sufficiently late that in maturing it will just escape the fall frosts. The poor varieties of Mexican corn formerly grown in Arizona are giving way to the improved white dent varieties from the North and East. Our seasons are sufficiently long to grow a crop of corn after harvesting a crop of wheat or barley.

ROOT CROPS, VEGETABLES, ETC.

Nearly all varieties of root crops are grown in Arizona. The wild potato is indigenous to the mountain regions. In the many small valleys throughout the mountains of the Territory enormous crops of potatoes are raised with a minimum amount of labor and expense. During portions of the year, in the irrigated portions of southern Arizona potatoes are raised in sufficient quantity to supply the local demand.

Market gardeners in the vicinity of the larger towns and villages grow vegetables during every month of the year. Cauliflower and cabbage are raised in large quantities, maturing in the early spring and shipped to Eastern markets. Watermelons are ready for market the latter part of June or early July. Sweet potatoes are raised in considerable quantities and are very productive. Peanuts have been raised in quantity by a few farmers, and upon the lighter soils are very productive and of superior quality.

FRUITS AND NUTS.

In the northern part of the Territory apricots, peaches, nectarines, grapes, and apples of surpassing quality are grown, but only in limited quantities. The Mediterranean grapes have been grown and shipped from Arizona for years. For two seasons varieties of grapes of the Eastern United States have fruited well upon the Experiment Station grounds. Apricots and grapes are shipped in large quantities from the Salt River Valley, the fruit going out fresh and dry. The improved varieties of oranges grown in Arizona are very attractive because of their bright color and clean appearance. Arizona possesses an advantage over other regions in growing oranges and other fruit because of early maturing, the fruit being ready for market in advance of the same varieties in other localities. Strawberries ripen in every month of the year in Salt River Valley. One grower in this section reports having gathered two tons of berries from less than half an acre of ground. The home market has thus far absorbed nearly all the crop. There is room for growing strawberries for shipment to distant markets. Figs grow luxuriantly throughout the southern part of the Territory, and wherever there is a sufficient supply of water given them they bear profusely. A number of varieties have been grown, and many of them

do well. The Japanese plums continue to lead in productiveness, and are of good quality. They escape frosts better than other varieties.

Almonds have been grown for some years in southern Arizona, but the crop has proved very uncertain on account of late spring frosts. This year, however, the orchards are as a rule loaded with fruit, and the prospects are that a full crop will be realized.

From an agricultural and horticultural standpoint the present year will be one of the most prosperous, if not the most prosperous, ever experienced by the farmers of Arizona.

GENERAL OBSERVATIONS ON THE FLORA OF ARIZONA.

There are but few States in the Union that have a more varied flora than Arizona. The Sonorean character of much of the southern portion of the Territory, with a maximum amount of sunshine and a minimum rainfall, is productive of vegetation not found elsewhere in the United States. The high plateau of the north and numerous mountain ranges, which break the surface of our southern plains, ranging from a few hundred to thirteen thousand feet above sea level, are productive of all degrees of climate, from the extreme heat of the lower valleys to that found at the summit of the San Francisco mountains, where snowbanks remain as late as August. Going hand in hand with this variation in climate is an equal variation in plant life.

The flora of the Colorado plateau and, to a considerable extent, of the many mountain ranges south of this plateau, is strikingly similar to that of southern Colorado and Utah. Here, among trees, are found pines, junipers, oaks, firs, balsams, and poplars. At the higher elevations the valleys are usually well covered with perennial grasses.

All of southern and central Arizona, with the exception of the higher mountains, has a flora entirely different. Succulent plants, including cacti, yuccas, and agaves, are here the most conspicuous forms of plant life. The plains are for the most part more or less thickly covered with a great variety of shrubs and bushes, in the protection of which many annuals and the weaker perennials find a home. Many of these shrubs enter largely into the forage of southern Arizona, and in seasons of extreme drought, to a great extent, take the place of the grasses, other annuals, and small perennials, which under normal conditions constitute the greater portion of our forage. The greasewood or creosote bush grows in abundance on the driest of our plains and is the most conspicuous and widespread shrub of the Territory. The water courses are lined with quite a variety of trees, the mesquite, cottonwood, willow, sycamore, and ash being the most abundant and, in the order named, probably of greatest economic importance.

At first sight there is a wonderful sameness about the flora of the plains, which has not escaped the notice of casual observers. The uniform, sage-green character of the foliage, with the great preponderance of red and yellow flowers, argues to the unscientific mind but few species. This is a misconception, as the flora of the plains is an exceedingly varied one, the great number of species only resembling each other in color of foliage and in other superficial characters. The monotonous character of the flora disappears, in a great measure, when on examination these plants, so uniform in general appearance, are found to include a large number of genera and species only differing from one another in the small variations compatible with their environment. These plants, as a rule, have diminutive or no leaves; hence the evaporating surface is brought down to the minimum. During the rainy season the tissues become gorged with water, which they retain with wonderful tenacity, enabling them to withstand many months of continuous drought.

The plants of the plains are usually covered with thorns and spines or the surface of the leaves and younger stems are covered with resins or other protective agents. They have become toughened and hardened by generations of exposure to heat and drought and are able to withstand the direst vicissitudes of their nativity.

The mountain flora shows a marked contrast when compared with the flora of the plains. The greater variations in the color of flowers and fruits, the deeper green of the foliage, and the larger leaves, reminds one of the flora of humid regions. This difference is due to the usual greater precipitation in mountainous regions and the higher elevation being productive of a slower evaporation.

The timber of the Territory practically belongs to the mountain flora; however, a large number of both deciduous and evergreen trees are scattered over the foothills and along the river courses of the southern plains.

A number of indigenous plants, a list much too long to enumerate here, have a local reputation for their medicinal qualities, many of them being kept for sale in our drug shops. It seems not at all improbable on investigation that in some of these will be found meritorious qualities which will give them a permanent place in our pharmacopœia.

The greater number of our weeds, and all of our more injurious ones, are introduced plants that do not properly belong to our flora.

The value of canaigre, a plant indigenous to southern Arizona, is already quite beyond the experimental stage and bids fair to prove in the near future of considerable commercial importance as a source for tannic acid.

NATIVE GRASSES OF ECONOMIC IMPORTANCE.

The soft and succulent grasses of the Eastern and Central States, in Arizona give place to a great variety of grasses with short, rigid leaves, and hard stems or culms. These grasses are eagerly eaten by stock, and as a rule contain a much higher percentage of nutritive matter than the grasses of more humid regions. As yet but few of our indigenous grasses, which number nearly 250 species, have been thoroughly tested in cultivation. It is known, however, from their natural environment that many of them will grow with a minimum amount of moisture. Our range grasses may be conveniently divided into two general classes:

First. The large number of species growing along rivers and creeks, in the vicinity of springs and tanks, and in other moist places. The most widely disseminated of these grasses is the common salt grass. This grass, although inferior to many others, is, on account of its abundance, the most important forage grass in many of the southern valleys. Two or three large species of the genus *Sporobolus*, known to cattlemen as Sacaton grasses, are important valley grasses of southern Arizona.

Second. The grasses which grow on the mesas and mountains cover large areas. These grasses are by far the more important, as they constitute the greater portion of the grass forage of the Territory and include those recognized by stockmen as mesquite grass, gramma, needle grass, and gietta. The greater number of these grasses are perennials, having hard, wiry leaves and stems, but very nutritious and usually well liked by all classes of stock. They grow rapidly after the summer rains and provide fine forage for the fall and winter months.

Much of the fall forage consists of a variety of annual grasses known as six weeks grass, from the fact that they spring into existence, grow and mature in from four to six weeks. These grasses appear after the summer rains and soon cover the plains with a more or less luxuriant growth of valuable forage. Drying on the ground and containing an

abundance of seed, they retain a high percentage of their nutritive qualities for months after maturing and are a large part of the forage during the winter months.

The frequency of the summer rains during the past two years, generally throughout the Territory, and the greatly diminished number of cattle on the range, have brought the natural pasturage into better condition than it has been for several years so far as grass forage is concerned.

Overstocking has a tendency to kill out the better grasses, and when this is augmented by one or more dry seasons, the range is several years in regaining its normal condition. Many of our grasses grow in isolated bunches or scattered about here and there, only a few culms in a place. These are the grasses that suffer from close cropping, for when the top is continually eaten to the ground no seeds are matured, and the roots gradually die or are trampled out by horses and cattle.

FORAGE PLANTS OTHER THAN GRASSES..

Probably in no other portion of the United States do we find so great a variety of plants, other than grasses, which may properly be termed forage plants. In many localities, during a portion of the year, grasses add but little to the forage. Cattle subsist largely upon the foliage of the mesquite, buck brush, white sage, pig nut, salt bush, and other shrubs and hardy perennials, many of which provide excellent forage.

Several plants belonging to the genus *Atriplex*, closely related to the celebrated Australian salt bush, recently introduced into the arid regions of the Southwest for purposes of forage, are abundant throughout south and central Arizona.

The leaves and ripened pods of mesquite are valuable forage. The beans, according to the report of Dr. Lowe, contain about 30 per cent of grape sugar, are very fattening, and readily eaten by both horses and cattle.

We have another tree somewhat similar to the mesquite, known as the screwbean, but smaller and less abundant. In some localities it also provides excellent forage.

During late winter and early spring, or in periods of extreme drought, when grasses become scant, the value of this class of forage becomes apparent. It is a means of keeping stock alive and in growing condition when without it they could not subsist. As the greater number of these plants are evergreen shrubs they are fed upon to some extent during all periods of the year. However, it is only in times of necessity that they become a large feature in range forage.

SPECIES OF INDIGENOUS TREES.

Arizona has about seventy-five species of indigenous trees, a number excelled by but few States in the Union. Of this number about half are evergreen, including a large number of species of pine and oak.

We have nine species of oak, ranging in size from a mere shrub to the black oak, which sometimes reaches a diameter of more than 4 feet. On our mountains and high plateaus are found eleven pines, from our large yellow pine to the small nut pine of our southern mountains. Four willows grow along our water courses, and two cottonwoods and an aspen find a home at varying altitudes. Four junipers cover large areas between 4,000 and 6,000 feet, or occur as isolated specimens on the foothills and lower mountains. A spruce, two firs, a balsam, and a cypress mingle with the higher pines, and farther down are found

two maples, three ashes, three species of mountain mahogany, two ironwoods, and species each of madrona, juneberry, buckthorn, redbud, mulberry, cherry, walnut, sycamore, alder, locust, and hackberry.

The following are more southern species, which extend along the water courses or are found on the foothills of southern Arizona, viz: Three palo verdes, three arborescent cacti, and one species each of soapberry, screwbean, mesquite, and desert willow. One species of each of the following genera occasionally reach the size of trees in southern Arizona, viz: *Vanguelinia*, *Canotia*, *Bermulia*, *Koeberlinia*, and *Cowaninia*. Among these may be mentioned the Douglas fir (*Pseudotsuga douglasii*), commonly known as Arizona pine, which reaches its southern extension on the high peaks of the Arizona mountains. Growing with the Douglas fir we find the western spruce (*Picea engelmanni*), the white pine (*Pinus flexilis macrocarpa*), and the close grained foxtail pine (*Pinus aristata*). The latter species has very close grained, compact wood and little resin. In mining operations it is valuable for timbering purposes, but in Arizona its inaccessibility has rendered it of little importance as yet.

Above 9,500 feet, where the forests have been cut away or swept by fires, the aspen (*Populus tremuloides*) comes in and reforests the denuded districts. Large tracts in the San Francisco Mountain region that in past years have been swept by fires are now thickly covered with a growth of aspen.

At the lower border of the zone of yellow pine, pin oak (*Quercus gambellii*), cedar (*Juniperus occidentalis monosperma*), and juniper (*Juniperus pachyphloea*) begin to appear, and as we pass below the belt of yellow pine its place is taken by a scattered growth of nut pine, represented in Arizona by three species (*Pinus edulis*, *Pinus monophylla*, and *Pinus cembroides*) worthless for purposes of manufacture into lumber. These small pines are characteristic of the low mountains and foothills of Arizona, and one or more species are found in nearly all the mountains of the Territory.

Large areas of the Colorado plateau, below the pine zone, are covered with a scattered growth of juniper. Mingled with the pines and firs on some of the higher mountains are a number of deciduous trees, including a maple (*Acer grandidentatum*) and a locust (*Robinia neo Mexicana*), while below the pines, at an elevation of from 6,000 feet to as many hundred, are more than forty deciduous and evergreen species which may properly be termed trees, but nowhere, with the exception of mesquite, growing in sufficient proximity to be termed forests. Nearly all, however, are valuable for fuel and other domestic purposes.

The forests of southern Arizona are confined to the high mountains and to the banks of the water courses, and disappear entirely from the valleys and low mountain ranges which constitute all of the southwestern portion of the Territory. The most important and widely distributed species, peculiar to the water courses of southern Arizona, is the mesquite (*Prosopis juliflora*.) The foothills are covered with a scattered growth of palo verde (*Parkinsonia microphylla* and *Parkinsonia torreyana*), mountain mahogany (*Cercocarpus parvifolius* and *Cercocarpus ledifolius*) giant cactus (*Cactus giganteus*), and a number of less conspicuous species. The canyons are lined with cottonwood (*Populus fremontii*), alder (*Alnus oblongifolia*), ash (*Fraxinus velutina*), willow (*Salix nigra* and *Salix taxifolia*), walnut (*Juglans respestria*) and black oak (*Quercus emongi*).

A number of rare and local trees are found in portions of the Territory. The Arizona cypress (*Cupressus arizonicus*) is a conspicuous tree in a

number of the high mountain canyons of the south and central regions. An ironwood (*Ostia knowltonii*) is restricted to the Grand Canyon of the Colorado, while an oak (*Quercus toumeyi*) is only found on the Mule Mountains.

. FORESTS OF ARIZONA.

General remarks.—The forests of Arizona are sonorian in character, and belong to the interior forest area, which covers all that region embraced between the forests of the Pacific and the extreme western limit of the Atlantic region. The forests of much of this area, when compared with those of more humid regions, are more stunted in growth, fewer individuals to a given area, and with much less variation in their composition. However, the forests of the southern portion of this area, which includes Arizona, are heavy, dense, and valuable, when compared with other portions of the interior region. In this Territory the valuable forests are confined to the higher portions of the Colorado plateau and to the slopes and canyons of our numerous mountains. They attain their highest development in the high San Francisco Mountains, and from here stretch away with more or less extended interruptions to and beyond the Grand Canyon of the Colorado to the north, to Bill Williams Mountain in the west, and southward to the great rim where the Colorado plateau breaks down to the southern plains.

To the southwest, with a number of interruptions, they become dense and heavy in the higher ranges of the White Mountains and from here extend into western New Mexico. Long arms of forest area also extend into all the mountains immediately south of the Colorado plateau, which reach an elevation of more than 7,000 feet. The isolated ranges farther south are also timbered above 7,500 feet. The great forest area embraced in the Coconino and San Francisco region is considered by our greatest authority on American forests as one of the largest unbroken forests in the United States. It is almost entirely of yellow pine (*Pinus ponderosa*) and its varietal forms. This species of pine is the most widely disseminated and abundant tree of the interior forest area, and in Arizona, where it reaches its highest development, is practically the only tree of commercial importance in the manufacture of lumber.

On the higher mountains of northern Arizona, above the area of yellow pine, are a number of trees usually considered valuable for lumbering purposes, but their restricted area and inaccessibility render them as yet of little commercial value.

INDIGENOUS TREES AND SHRUBS FOR SHADE AND ORNAMENTAL PURPOSES.

The people of Arizona do not properly appreciate the value of nature's trees and shrubs to plant about their homes for ornamental and shade purposes. We can not expect to bring trees and shrubs from regions where they have been accustomed to a humid atmosphere and grow them with any degree of success in Arizona.

We are inclined to look to foreign countries and other States for our ornamental trees and shrubs, when with a little care in selection we can find in our own flora a variety of such plants that will grow with a minimum amount of care and in a few years surpass in appearance anything which we may bring in from outside. Generations of exposure to the conditions of an arid region enable them to survive and even flourish where plants unaccustomed to such an environment perish.

The ash is one of our most valuable trees for street planting. Its

growth is rapid and it is but little affected by insects. The cottonwood, although not so desirable as the ash, gives dense shade during the summer, grows with great rapidity, and requires little care. If in planting care is exercised to plant only staminate trees, no cotton will be produced and the chief objection to them removed. The desert willow, a beautiful tree with catalpa-like flowers, one of the most graceful trees in America, grows along the water courses of southern Arizona, and should take the place of many trees which we now get from outside.

It is hoped that the people of Arizona will give more attention to our native trees and shrubs, as they are more in harmony with our surroundings and better adapted to the purposes of landscape gardening. Many of our shrubs are evergreen, while others have attractive flowers or fruits. By proper care in selection they are in the end much more satisfactory and less liable to die than imported plants.

SETTLEMENT OF LAND.

The following statements from the general land offices at Tucson and Prescott show the amount of land taken up in the Territory during the past year, giving amount of land covered by original and final entries:

Transactions for fiscal year ending June 30, 1898, in the United States land office at Tucson, Ariz.

Class of entry.	Number of entries.	Number of acres.
Original entries:		
Homestead entries.....	140	19,289.14
Excess entries.....	1	.73
Preemption entries (town site).....	1	640
Desert-land entries.....	33	4,955.83
Mining applications.....	5	400.53
Total	179	25,296.23
Final entries:		
Homestead.....	75	9,940.35
Desert land.....	14	2,640
Timber culture.....	2	318.08
Cash (commutations).....		1,277.02
Mining entries.....		473.25
Forest reserve lieu selections (act June 4, 1897).....		1,273
Total	121	15,920.70
Aggregate.....	300	41,206.93

Tucson land district, June 30, 1898.

County.	Area unappropriated and unreserved.			Area reserved.	Area disposed of.	Total area of land surface of the country in land district.
	Surveyed.	Unsurveyed.	Total.			
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Apache.....	21,206	18,009	39,215	204,980	2,805	247,000
Cochise.....	1,352,789	2,239,445	3,592,234	135,077	264,689	3,982,000
Gila.....	41,971	391,930	433,901	745,807	31,792	1,211,500
Graham.....	785,044	2,017,084	2,802,128	1,000,000	245,872	4,138,000
Maricopa.....	1,144,294	2,682,686	3,826,980	193,000	656,020	4,679,000
Navajo.....				70,000		70,000
Pima.....	1,080,982	4,985,992	6,066,974	197,414	449,612	6,714,000
Pinal.....	811,302	2,046,315	2,857,617	375,970	240,913	3,474,500
Yuma.....	617,685	3,869,391	4,487,076	110,000	334,924	4,932,000
Total	5,855,373	18,250,852	24,106,125	3,122,248	2,219,627	29,448,000

Prescott, Ariz., land district, June 30, 1898.

County.	Area unappropriated and unreserved.			Area reserved.	Area disposed of.	Total area of land surface of the country in land district.
	Surveyed.	Unsurveyed.	Total.			
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Apache	1,424,269	788,877	2,213,146	3,489,399	1,220,455	6,923,000
Cocconino	1,231,634	9,280,220	10,511,854	2,023,748	694,898	13,230,000
Gila	41,513	1,295,600	1,337,113	378,127	2,760	1,718,000
Maricopa	154,013	1,217,732	1,371,765	40	3,215	1,375,000
Mohave	984,099	5,725,054	6,709,153	883,960	42,857	7,136,000
Navajo	1,408,385	788,000	2,196,385	3,103,320	1,010,295	6,310,000
Yavapai	831,634	3,897,968	4,729,602	85,550	491,848	5,257,000
Yuma		1,193,900	1,193,900	201,600		1,395,500
Total	6,075,547	34,187,351	30,262,898	9,615,774	3,465,828	43,344,500

Character of unappropriated and unreserved land: Mountainous, broken, arid, grazing, and timber lands.

Class of entry.	Entries.	Acres.
Homestead entries.....	143	20,890
Cash entries.....	38	8,950
Desert-land entries.....	5	441
Mineral applications.....	18	1,360
Final homesteads.....	50	7,420
Final desert.....	2	319
Final mineral.....	21	506
Total	277	34,976

MINING.

The great value and prominence of this industry in Arizona and the phenomenal mineral wealth of the Territory justify extended consideration and the publication of thorough and comprehensive information on the subject. A careful study of the following report of Prof. W. P. Blake, Territorial geologist, will convince the reader that precious metals in almost inexhaustible quantities can be found much nearer than the far-off Klondike:

DISTRIBUTION OF METALLIC WEALTH IN ARIZONA.

CLIMATIC CONDITIONS.

Arizona is essentially a mineral-producing territory. There is no other part of North America of equal area where probably such a variety of minerals can be found. Many of these minerals are extremely rare and occur elsewhere but sparingly and as curiosities for the cabinet of the mineralogist, rather than in commercial quantities, as in several instances in Arizona. But there is not only a great variety of minerals, but the geological structure is varied and comprehensive. Representative outcrops, ridges and mountains, are found of nearly or all of the chief formations and systems known to the science of geology. And so far there has been but comparatively little systematic study of these formations. The field is new; the harvest is ready, but the reapers are few. This results partly from the immensity of the distances, the great scale upon which the territory is built, the absence till recent years of railway transportation, the presence of blood thirsty savages, now happily restrained, and the failure, with but few exceptions, of any appropriation of money by the General Government or by the Territorial legislature to defray the expenses of exploration and publication. The unparalleled magnificence of such grand features of the earth as the Canyon of the Colorado and the chain of extinct volcanoes towering above it have, we may say, compelled attention as the monographs of Powell and of Dutton may testify. The rapid reconnaissances of Sitgreaves, of Whipple, of Parke, Emory, Bartlett, Grey, and others are not forgotten,

but the fact remains that we yet know but little, in detail, of the structure of the mountain ranges of Arizona, and of the treasures they contain.

"An attempt to show the geographical distribution of the mineral wealth of the Territory of Arizona results in the generalized statement that all of the mountain ranges are mineral bearing. Even the plateau region of the northeastern portion has its deposits of value of building stone and of coal, and probably of other mineral substances of commercial value." This statement, penned in the report for 1896, has been notably verified in the discovery of deposits of copper ore north of Williams, and extending even to the borders of the Grand Canyon. But the chief region of occurrence of the precious metals, of copper, of lead, and of other metals and minerals, lies southwestward from the Grand Canyon region and of the great lava districts around the extinct volcanoes of the San Francisco Mountains, which we may assume cover from view important deposits of mineral wealth. The uplifted and strongly scarped and eroded mountain ranges of the central and northern portions of the Territory are more accessible to the prospectors and reveal their treasures more completely.

The chief region of metalliferous minerals and mines thus commences on the northwest, in Mohave County, at the sharp bend of the Colorado River at Callville, and it extends southeastward diagonally across the Territory for nearly 500 miles in a broad belt of high and rugged mountains, including the Bradshaw Mountains, the Mazatzals, the White Mountains, the Apache and Pinal mountains, the Santa Cataline Mountains, the Santa Ritas, Huachucas, the Chiracahuas, the Dragoons, the Mule Mountains (Tombstone), and other ranges. All these mountains, with their spurs and subordinate parts, are known as mineral bearing. They all invite and reward faithful prospecting. In support of this statement we need to refer only to the discovery in the granite rock of the Dragoons, in 1898, of valuable deposits of tungsten, elsewhere noticed in detail, and to the late discovery, also, of a promising vein of the precious metals upon the western slope of the Baboquivari range.

The chief towns, cities, mining camps, and mining districts are distributed along the course of these mountain ranges of central and southern Arizona in one broad belt, extending diagonally across Arizona from Nevada to Mexico. Commencing on the northwest end at the Colorado, we have in succession southeasterly Mineral Park; Hillside, Congress, Jerome, Prescott, Phoenix, Florence, Pinal, Globe, Mammoth, Tucson, Tombstone, Bisbee, Pearce, Arivaca, and Oro Blanco. The Longfellow copper mines and others of Clifton lie upon the northeastern border of the belt, while upon the southwestern border we find the celebrated district of Harquahala, Weaver, Vulture, and many other districts. Passing farther westward, we come upon the Zower or Piedmont region of broad and extensive valleys and plains broken by numerous isolated ridges and ranges, all trending northwest and southeast parallel with each other and with the main central axis of mountains.

These mountain ranges and valleys fill out the area of the Territory to the Colorado on the west and Mexico on the south. They are all mineral bearing.

The ancient district of Castle Dome, celebrated for its beautifully formed veins of argentiferous lead ores, lies about 20 miles north of Yuma in the extreme southwest corner of Arizona. Silver district, with very large veins carrying silver ore, adjoins Castle Dome northerly, and there is a continuous series of mining camps, and locations of gold, silver, and copper ores northward along the Colorado River to La Paz, Ehrenberg, Bill Williams Fork, Mohave, and beyond. And directly across the Colorado River in California, but tributary chiefly to the development of Arizona, there are the gold-bearing districts of Picacho, the Blacto Range, and the Mohave Desert region, reached by the Atlantic and Pacific Railway.

COMMUNICATION—TRANSPORTATION.

The great trunk lines of railway, portions of two transcontinental systems, traverse Arizona from east to west and give convenient access to the mining regions on the north and on the south. The Southern Pacific entering the Territory from New Mexico, near San Simon, crosses the counties of Cochise, Pima, Pinal, Maricopa, and Yuma. The Atlantic and Pacific road, entering from New Mexico on the headwaters of the Puerco, a tributary of the Little Colorado, crosses the counties of Apache, Coconino, Yavapai, and Mohave. It crosses the Colorado River to California at the Needles. These two transcontinental lines are connected from north to south by the Santa Fe, Prescott, and Phoenix Railway, and the Maricopa and Phoenix and Salt River Valley railway. A branch road from Benson southward extends to the Gulf of California at Guaymas, and another road, the Arizona and Southeastern Railroad, extends from Benson to Bisbee. A branch from the Southern Pacific, at Teviston or Bowie Station northward to Solomonville and beyond towards San Carlos and Globe, and known as the Gila Valley, Globe and Northern Railway, will, when completed, give access by rail to the extensive copper-bearing district of Globe. The copper fields of Morenci and of Clifton are reached by the Arizona and New Mexico Railway,

which connects with the main line of the Southern Pacific at Lordsburg, N. M. Those only who have lived and labored in Arizona before the construction of these roads can appreciate their inestimable value to the Territory and to civilization. They have rendered possible the proper development of the mineral and agricultural resources of Arizona.

CLIMATIC ADVANTAGES OF ARIZONA, WITH REFERENCE ESPECIALLY TO MINING.

The Territory of Arizona enjoys peculiar advantages in respect of climate for working mines and ores. Mining in the open air, without the protection of buildings, can be conducted every day in the year without hindrance from snow or extreme frosts. Even in the midst of the Bradshaw Mountains, or central mountain ranges, snow rarely falls to so great a depth as to seriously interfere with mining work or to impede or suspend transportation. The air at all seasons is comparatively dry and bracing, and in midsummer a slight shade of brush or canvas suffices to keep off the excessive heat of the sun. Death by sunstroke is unknown. In mid-winter the days are bright and clear and are highly favorable to protracted labor. In the region of Tucson, at an altitude of nearly 2,500 feet above the sea, while the nights in winter are frosty and bracing, severe and long-continued freezing weather is unknown. Water in open, shallow pools freezes at night, but when covered or in pipes a slight protection by soil or wrappings is sufficient to prevent freezing. The great heat of the sun by day warms up the soil to such a degree that frost does not penetrate deeply or freeze the ground if dry. The luxuriant growth of many of the cactacea and other plants among the cliffs and rocks of Arizona, which could not for a night withstand the frost of a Northern or Eastern winter, may be explained by the fact that the rocks absorb large amounts of heat from the sun by day and radiate this heat slowly at night. Some of the very dark-colored rocks, or those with a black surface, exposed to the sun on the deserts become so hot as to be uncomfortable to the hand. Cliffs of black lava thus become repositories of heat and exert an important influence upon the growth and distribution of plants.

The economic industrial advantages of being able to work the mines and mills or leaching works without hindrance or interruption by the weather may be best appreciated by those who have had to combat the furious freezing storms of Colorado, Montana, Idaho, or the Klondike. Expensive plants in Arizona for leaching out gold by cyanide solutions or by chlorine water do not require the costly protection of buildings or artificial heat. The work may be carried on continuously every day in the year without being frozen up.

The following extract from Bulletin No. 20, of the Arizona Experiment Station, entitled "Arizona Weather," explains in a way that the uninitiated may understand how it is that the climate of Arizona is so very pleasant, even when the thermometer rises above the one-hundred mark. We quote at length:

"In any inquiry regarding Arizona the question first to be raised is that of temperature. The general interest in this element has a scientific foundation on the fact that temperature is the most important of all climatic factors, since all others depend directly or indirectly upon it. The popular curiosity in this element, however, proceeds not from scientific fact, but from the generally accepted misinformation as to the torrid heat experienced in this region. The widely circulated tales of the would-be humorists have done more than all other causes to give Arizona the name of being uninhabitable. Generations of actual residents will have passed away before the harmful effects of these thoughtless tales will have wholly disappeared and knowledge secures general recognition that this region is not the hopeless desert it has been represented.

"The simple thermometer, no matter how accurate it may be, does not measure temperatures as shown by animal life. Its records may be considered in connection with certain other data in order to afford a mode of comparison with the climates of other portions of the earth. We may term the reading of an accurate thermometer the actual, and the sensation of heat or cold as felt by higher orders of animal life the sensible temperature. Neither of these is a measure of the other. The fact is well known to meteorologists that the thermometer alone can not indicate the sensible temperature, but that the humidity of the air must be considered in connection with the actual temperature. This fact is also known to dwellers in the arid regions, but it is not known to the majority of otherwise intelligent people throughout the world. The reputation of Arizona has long suffered from the prevalent ignorance on this point. Records of maximum temperatures enable comparisons to be made which appear unfavorable to Arizona, and lead to the belief that the heat of this so-called desert must be almost, if not wholly, unendurable.

"Where the percentage of atmospheric moisture is high, both extremes of temperature are felt to be greater than the thermometer indicates. Everyone knows something about that condition of the weather which is variously termed 'sultry,' 'close,' or 'muggy.' These terms describe the result of a combination of heat and

moist air. This is the condition which exists commonly in the tropical regions of the world where the rainfall is heavy and in the same way, though in a smaller degree, throughout the United States outside of the arid regions. It is especially noticeable in the States bordering upon large bodies of water, such as the Gulf of Mexico or the Great Lakes, and is conspicuously absent from the greater portion of Arizona.

"In the dry air of this Territory sunstrokes are unknown, while in the Mississippi Valley and the States lying eastward whole columns of the newspapers are filled with accounts of prostrations from heat, and fatalities are numerous whenever the thermometer indicates 90° F. or upward. At many places along the seacoast where the humidity always remains near the point of saturation, a temperature of 85° brings excessive discomfort, and exertion or exposure to the sun is extremely hazardous. Men and the lower animals perform in safety their customary labor beneath the cloudless skies of Arizona under the highest temperatures ever experienced here. The dry air induces exceedingly rapid evaporation of the abundant perspiration, thus keeping the body at a comparatively low temperature. As a matter of course the supply of fluid must be maintained, hence the great thirst so often experienced by travelers in desert regions and the imperative necessity for an adequate supply of drinking water. Of all the lives lost on the desert stretches of western America—and their number is not small—not one is directly attributable to heat, but to thirst. The experienced traveler provides an ample supply of water and fearlessly invades the worst desert yet discovered.

"An amount ranging from 15° to perhaps 30°, according to the humidity, should be subtracted from the records of maximum actual temperatures during the hot season in Arizona to indicate the sensible temperatures. In like manner the dry air of the arid region enables extremely low temperatures to be endured without discomfort. The winter cold of the Canadian Northwest Territory is much less disagreeable than that of the United States immediately south of the Great Lakes. The lowest temperatures known on the high plateaus of Arizona bring less discomfort than a 'chilly day' in New Orleans."

GOLD—ITS DISTRIBUTION IN ARIZONA.

Of all the metals, gold is the most widely and generally distributed in all parts of Arizona. It occurs either as placer deposits or in veins in nearly every mountain range from Yuma on the west to the Chiricahuas on the east, or over the whole breadth of the Territory. Locally, it is more generally spread along the course of the mountains and in the streams descending from them. Many of the placer deposits are but partly worked, owing to the scarcity of water.

THE CONGRESS MINE.

I am indebted to Mr. William F. Staunton, superintendent of the Congress group of mines, for the following description of the property, prepared at my request:

The Congress group of mines is located in Martinez mining district, Yavapai County, Ariz., near the line of the Santa Fe, Prescott and Phoenix Railway, about 70 miles north of Phoenix and 68 miles south of Prescott. The mines are the property of the Congress Gold Company, a company incorporated under the laws of Arizona.

The town of Congress and the mines and reduction works are located at the mouth of a short canyon, broad enough at the bottom to give ample room for the necessary buildings for town and works. The outcrops of the veins are on the mountain sides, giving abundant fall for waste dumps and the proper arrangements of mills.

The water supply comes from Martinez Creek, 1 mile away. It is raised 500 feet by a steam pump to get over the ridge and runs into the camp by gravity.

Three hundred and fifty men are employed in the mines and surface works. The mills, mine, and all company buildings are lighted by electricity. The company owns and operates its own railroad from the junction to the camp. By a system of switchbacks the cars are taken up the mountain side so as to deliver coal, timber and other mine freight directly at the mines.

The company operates a general merchandise store and boarding house, and provides sleeping rooms lighted by electricity for its men. A hospital is also maintained, where the injured and sick are cared for.

The wires of the Postal Telegraph and Cable Company come into the camp, and the Congress company maintains a regular office.

Claims.—Twenty-two claims are owned or controlled by the company, but the greater part of the work has been done on only two, the Congress and the Why Not, although the others all carry promising veins and will be explored in the future.

Geology.—The country immediately around Congress is all granite and granitic gneiss. This rock is cut through by a series of approximately parallel dikes of

greenstone trap, having a generally easterly and westerly strike and a dip of about 20 degrees to the north. The Congress vein is in one of these dikes, or perhaps it may be said that the dike is the vein, for ore has been found in the dike in all possible positions from one granite wall to the other, but generally occupying a position near the foot wall and separated from it by a layer of vein selvage. The dike has a thickness of about 15 feet, measured at right angles to the walls, but this is uncertain, as we rarely see the hanging wall in the mine, the drifts hugging the foot wall and their height not being sufficient to expose the hanging. These greenstone dikes are crossed by other more nearly vertical dikes, having a northeasterly and southwesterly trend. The cross dikes are apparently a kind of quartz porphyry. Very little is known of them, as they do not appear to be ore bearing and have been but little exposed in the underground works. They do not seem to mark lines of faulting, as the greenstone dikes are not thrown at the intersection. They are apparently of more recent origin than the greenstone dike, as they seem to cut the latter and occupy the space of intersection.

The following analysis of a specimen of greenstone was made at the Sheffield Scientific School, Yale University. No analysis of the quartz porphyry has yet been made.

	Per cent.		Per cent.
SiO ₂	52.20	MnO	1.00
Al ₂ O ₃	13.40	CaO	9.60
FeO	9.75	MgO	1.16

Besides the Congress vein, described above, and upon which nearly all the work has been done, there are several others of great promise on the surface and holding out well to the extent of the development work that has been done upon them. The principal of these is the Niagara vein, running nearly parallel with the Congress, but, unlike the latter, seeming to be entirely inclosed in the granite without the accompanying dike, which is such a marked feature of the Congress vein. Preparations are now being made to thoroughly explore the Niagara vein, with a view to largely increase the ore output. A crosscut is being run from the Congress workings on the 1,375-foot level to cut the Niagara vein, and a new shaft is being started (on the outcrop), which will be pushed down to a connection with this crosscut on the vein at the 1,375-foot level. There are already two shafts on the vein—one on the Remnant, 250 feet deep, and the other on the Why Not, 150 feet—both showing the vein strong and continuous to these depths, and carrying ore which gave concentrates assaying 15 ounces gold and 55 ounces silver. The high silver is a peculiarity of the Niagara vein, distinguishing it from the Congress, the concentrates from which rarely carry over 3 ounces of silver per ton.

There are numerous smaller veins carrying good ore and running approximately parallel to the Congress and Niagara, but none of them have been explored to any extent.

Ore.—The Congress ore is white quartz, carrying very pure iron pyrite, generally disseminated through it in small particles, but at times in quite massive form. There is little if any gold in the quartz showing no pyrite, and hardly any free gold exists in the ore. The pyrite carries on an average about 8 ounces of gold per ton. Other sulphides so commonly accompanying iron pyrites are notably absent, a little galena of very rare occurrence being the only one identified, and chemical analysis of the concentrates from the ore showing hardly a trace of copper, arsenic, antimony, or indeed of anything but iron, sulphur, and silica.

The Niagara ore, on the other hand, shows considerable galena and some copper minerals besides the iron pyrite. This difference seems to be rather characteristic of the ore of this neighborhood when the veins are entirely in the granite and distinguished from those which are accompanied by the greenstone dikes.

As stated above, the ore in the Congress vein is generally near the foot wall. Its position and appearance suggest that it occupies what has been the exceedingly flat lenticular cavities produced by a fracture of the dike along the place of its dip, followed by sufficient movement along the line of fracture to leave such cavities by reason of the inequalities of fracture. There is no evidence of the replacement of the greenstone by quartz, the whole appearance being that of the filling of pre-existing cavities by deposition from mineral waters. The valuable contents of the vein have been quite likely derived from the greenstone by segregation and infiltration. The above hypothesis regarding the origin of the vein is somewhat strengthened by the fact that no clearly defined ore shoots have yet been observed in the mine, the ore being in flat bodies with no more apparent relation to one another than would have been the case were the mode of formation as suggested. In one part of the mine the dike has been crowded into a wrinkle, such as would be caused by exerting a side pressure on the pages of a book, causing them to separate and leave more or less S-shaped cavities. In the case of the dike, this has been followed by the filling of these cavities by quartz and ore, making an unusual expansion in the size of the vein.

Under-ground works.—The accompanying maps show clearly the relative position of the different claims, as well as the under-ground workings. There are three principal shafts on the Congress, all sunk on the vein and conformably to its dip. The No. 2 shaft is at present the main working shaft, and has attained a depth on the vein of 1,740 feet. The 1,700-foot level is now being opened, and shows the dike and ore to be continuous and strong to that depth. The No. 1 shaft is also used for working purposes, and will be carried down with the No. 2 and connected with it at intervals of about 300 feet for air and to block out the ground preparatory to stopping. The No. 3 shaft is at present merely an air connection, but a hoist has been ordered capable of sinking it 2,000 feet, and it will ultimately become of great importance in the operation of the mine.

The system of mining aimed at is to block out the ground by main levels, driven dead, approximately 300 feet apart. Stopes are then started at the shaft and rising above these levels. As the tops of the stopes are reached to the height decided upon as the proper distance for another level (generally 75 feet), the level is carried in, practically being already formed by the stope, with the exception of a little cutting of the roof to make room for the timbers. The ground stope out is filled with waste as soon as possible, as the roof soon becomes heavy and the temporary supports put in during stoping would crush without the filling. By this method of stoping a large part of the waste broken is kept under ground, serving the purpose of supporting the roof, saving hoisting, and causing the air to circulate upward along the working breast of the stopes.

Reduction works.—The present reduction works consist of a 40-stamp mill and a cyanide plant for treating the tailings. The milling process is as follows: The ore from the mine is dumped on grizzlies, the oversize passing through two 9 by 13 inch black crushers and thence with the fines to storage bins of about 100 tons capacity. Tullock feeders draw their supply from these bins for the 40 stamps. The stamps weigh 850 pounds each, and drop 6 inches 90 times per minute. Steel-wire screens are used of 20 holes to the linear inch, No. 24 wire. The pulp is fed direct to 20 Fruevanners, equally divided between them. The resulting concentrates are dumped upon a sand filter to drain, and while still moist are loaded in bulk, without sacking, into cars for shipment to the smelter, at present the El Paso Smelting Works. The tailings pass to a Freuer & Le Blanc sand pump, which elevates them to settling tanks, where the surplus water is removed and pumped back to be used over again, while the tailings are run in cars to the dump.

Fine crushing and concentration at one operation on such material as the Congress ore is not a clean operation, but is probably the best process available, considering the very small supply of water. The concentrating percentage is in the neighborhood of 80 on \$16 original ore, and the greater part of the loss is in the very fine slimes. It is quite probable that closer work could be done by hydraulic classifying previous to concentration, but the changes in the mill necessary to introduce this in a proper way would be quite extensive, as the necessary fall between the batteries and vanners is at present lacking. Furthermore, it is quite likely that the present reduction process may be entirely replaced by the cyanide treatment of the original ore, and until this question is finally decided it is not desirable to make any changes in the present arrangement of the mill.

Cyanide works.—In the spring of 1895 a cyanide plant was built to work the tailings. It consisted of three 26 feet diameter by 4½ feet deep leaching tanks made of Oregon pine, four 15 feet diameter by 10 feet deep solution tanks, together with the necessary pumps, piping, zinc boxes, car tracks, etc., the whole being included in substantial buildings. The process worked fairly well at first when the old oxidized and sandy tailings were used, but when it came to treating the more recently made tailings, which had not had time to oxidize and which were quite fine, filtration difficulties appeared which we were unable to overcome by raw treatment. A thorough trial of the agitation process, substantially as employed for slimes in South Africa, was made, but the process proved too wasteful of cyanide and water. As the result of careful experiments made on a working scale, we are now building a Brown mechanical roaster of 100 tons per day capacity, with the intention of roasting all the tailings previous to cyanide treatment. Only a very light roast is required to thoroughly oxidize the tailings and put them in such condition that the solution will readily percolate through them and give an excellent extraction. The process will be as follows: The tailings will be plowed to partially dry them. They will then be taken by wheel scrapers and dumped into a Stedman pulverizer, from which, by elevator, they will be discharged into a storage bin and thence to the self-feeder of the furnace. Emerging from the furnace after four hours' roasting, they will be automatically carried along on a cooling hearth and discharged into a storage bin, from which they will be elevated and spouted to the leaching tanks. This new tank will probably be in operation by December 1, 1896.

Production.—The production of the company in 1896 was at the rate of about 3,600 ounces of gold per month, all from the Congress vein. With the opening of the

Niagara vein, and the largely increased milling plant now in contemplation, this rate of production will probably be doubled in the near future. Present indications point to the probable adoption of the direct cyanide treatment of all ore, preceded by roasting.

LA FORTUNA MINE.

[From a stenographic report of a lecture to the students at the Arizona School of Mines.]

In the early days of gold discovery in California, in 1848, when the news reached the gold miners of Sonora, there was a general exodus of the able-bodied men who were able to get away northwest to the new El Dorado in California, and the State of Sonora contributed many men to the mining population. They took the old road, which was known as the "Camina Real" from Estancia and Altar northwestward, nearly parallel to the gulf, following the mountain ridge known as the Gila Range, just north of our present boundary. The road led to Yuma, and in passing by the Gila Range they went within a few feet or yards of a very modest outcrop of quartz, which no one seemed to consider of sufficient value to merit any attention. That humble and insignificant quartz outcrop is to-day the outcrop of the great Fortuna mine.

It is situated on the westward slope and nearly at the base of the range of mountains called on some of the old maps the Gila Range. This trends northwestward, and reaches nearly to the Gila River at the point now known as Blaisdell. The railway in its course to Yuma passes around the northwest point of this range. Where the rocks are exposed at that point they are mostly of homogeneous granite, of gray color and weathered out at the surfaces, which, however, are much pitted, as if by decomposition of some soft substance. But beyond these low-lying hills of granite there are big outcrops of rock, which to the experienced eye indicate stratified formations. They are indeed stratified, for the bulk of the range southward and south-eastward is composed of regularly stratified, laminated hard gneissic rock. I use the word gneissic in a very general and comprehensive sense, for you can describe these rocks with much more accuracy if you localize them, as mica slates and hornblende slates, with interpolations of quartzite beds, especially in the upper part of the series.

Leaving the train at Blaisdell and taking a 4-horse wagon, we traveled to the Fortuna mine over the sandy plain which borders the mountains, and which extends from the foot of these mountains to the Gulf of California. This plain has also been called the Sonora Mesa, or Sonora Plain. It extends not only southward and southwestward, but far south into Sonora, and is the bordering plain which reaches from the mountains down to the very shores of salt water. The view in that direction is unlimited and unbroken, and is bounded by the horizon. The water of the gulf is not visible, but it might be seen, however, from some of the high summits.

The distance to the mining camp known as La Fortuna is about 15 miles. This camp has been built up entirely by the merit of this vein or mine, and is sustained by that mine alone, for there are no other claims or mines being worked to any extent in that region. The camp consists of the usual motley assemblage of improvised houses, tents, and adobes, grouped irregularly around the mill of the company. We drove to the hotel, kept by a Chinaman, where we got most excellent meals, with good ice water, such as it was, somewhat saline to the taste, and, as I afterwards found, capable of eating holes in wrought and cast iron. This water is pumped from the neighborhood of Blaisdell. The pipe line is over 12 miles in length. It consists of 4-inch wrought-iron or steel pipe connected by steel bands, and the total lift is about 550 feet above the level of the well from which the supply is obtained. This well is not very far from the river, perhaps half a mile, but being sunk in the river sands the water supply is ample. The outcrop of the Fortuna vein or mine is obscure and so insignificant that I had to be directed to it by the superintendent of the mill, who showed me where it could be found, under some timbers or foundation work, where there had been a cropping out of some 5 or 6 feet of quartz, most of which had been dug out, interstratified between the mica slates. The quartz is 5 or 6 feet wide, measured of course at right angles to the foot wall and hanging wall. There are, however, in the slates of the hanging wall little feeders or stringers running parallel with the main body for a distance perhaps of 2 or 3 feet, but interstratified with the slates, which are pretty regular in their dip and lamination, and pitch at an angle of from 45 to 50 degrees to the southwest.

Above this outcrop the hill rises to 60 or 80 feet, and there is no sign of quartz upon that line. Indeed, this is the only outcrop which they had to follow and work upon. The hanging wall consists chiefly of hornblende slate and the foot wall of very compact well-laminated mica slate, so it seems to be between the slates and to be entirely conformable with them. However, as we shall see later, it may be that this conformability at this point is only apparent; it is real so far as this particular point on the lode is concerned, but at other points there is reason to think that it cuts across the beds. The outcrop of quartz is more or less stained faintly

with green stains, supposed to be stains of copper and decomposition of copper ore, which they probably are, although there are some peculiarities of color, and some yellow colors, which indicate to me the presence of some other mineral, possibly tellurium, which by its decomposition has given these colors. The fact remains, however, that the bullion from the upper part of the vein contains more copper than it now contains in the lower levels of the mine. The workings which have been carried on here have developed a condition of things which could not be foretold from an inspection of the outcrop. The vein or lode appears to be a chimney, not a continuous ore body nor a continuous vein with an ore body or chimney or chute upon it. As I have told you, the outcropping points indicate that there is no very great longitudinal extension of this ore. That is found to be the case, although there is much greater extension, so far as I was able to ascertain, than would be indicated by the surface.

As shown by the diagram upon the board, this is not the only vein or ore body. There are other portions of the ledge, which, by working, have been found to go into the first one in depth. One of these is called the Christmas Gift. It is a branch, apparently, and is supposed to be connected with the main ore body in depth, but that has not yet been shown. We have at least two outcrops of quartz which are found in depth to come together. The point of intersection is like the point of the letter V. I represent here an inclined shaft sunk from the hillside in such a way as to intersect and pass through the lode upon its dip. Usually we put an incline shaft, if possible, upon the plane of the vein, but in this case it is put down at right angles to the plane of the vein through dead ground, and when the miners get down a sufficient depth they run their crosscuts to intersect the lode, and this mine is worked in that way by a system of crosscuts from the incline shaft. They are now down about, well, possibly 450 feet, but the last 50 feet consists of a winze below the 400-foot level. That winze is run down upon the plane of the vein, and is in ore all the way, and some of the best ore yet found in the mine comes from the bottom of this winze. When the workings reached, or came near the point of intersection of this big vein, they suddenly came into a lot of barren ground; in fact, they ran out of ore and into rock. The ground above the rock was considerably broken, and between this rock and the hanging wall there was the merest seam, not thicker than a knife blade, if so thick. The mine seemed to have given out, and for a time the owners were ready to throw up their hands and say to any one who wished to buy the mine, "Let them have it."

Mr. Church was out there from New York inspecting the property with a view of its purchase. This block of rock at the bottom of the shaft was very discouraging, but Mr. Wiggins, the gentleman who had charge of the works at that time, theorized about this in a very common-sense and accurate way, and he decided that this block of rock had dropped into the vein, not being supported at this point of intersection. An underlying branch lode dipped into it and formed this V-shaped intersection. Wiggins said that this rock which we had found had dropped off from the point which was left unsupported by the two cracks or cavities, and consequently this rock dropped down and laid upon the foot wall of the back vein and filled up this space, leaving broken-up ground above it. They found broken-up material, rock, and confused mixture, and when they went forward they went into this mass of rock which is now supposed to have been merely the wedge-shaped mass which dropped from the point of ground above. In the mining parlance of the Cornishman it was a "horse," and a dead horse at that. As soon as the superintendent had cut through this rock mass he came into the unchanged ore or quartz below. I say unchanged—the general character of the lode was the same, but it was rich in gold. It was larger and better than above. The theory upon which they now proceed is, that the second vein that underlies the two others, and called the "Christmas Gift," will, in its turn, intersect the main chimney or lode, and by that intersection will enrich it, and they are hopeful for a still better mine than they now have, when that point is reached. It is hypothetical. No one can tell where, if at all, it will reach the main lode. The thin tree-like form which I have represented upon the board, a tree with its branches spreading out, is the supposed condition, and they look also very properly for another broken-up space at a point still lower down.

But the work which they have done and the yield which they have secured from the chimney of ore, or quartz, up to this date is very satisfactory, and, in fact, is so encouraging that they project a much deeper shaft than the one they now have—a shaft which will intersect the lode at or below the point at which the Christmas Gift lode is supposed to become united with the Fortuna. That shaft may be 1,000 or 1,200 feet in depth. They are talking now of about 700 feet. But the structure of the chimney is peculiar. It is not as simple as the simple structure of the country would indicate, but in descending into the earth it changes its direction or strike. The strike of the slates at the surface would be supposed at first to be the strike of the chimney, so far as it has any strike, below. But the strike seems to

assume a curved line below. At one point of this curve we have the discovery shaft; at the 200-foot level we will see we have the workings to one side. It seems to bear away westward from the line of strike. The next level is a little farther to the west, and so on in succession until you get to the 400-foot level, the dip being always northwest, as indicated by the arrows, and if these lines were projected they would come to a point of intersection like the radii of a circle. It is impossible to say whether this dip will be maintained, or to decide, from the limited explorations so far made, exactly whether this lode or chimney may be found by a vertical shaft. But acting upon the evidences, and weighing them, they are intending to place a shaft so as to be within the quadrant of a circle, between the focus of these lines of dip and the outside of the circle. In this respect the vein is one of the most interesting and remarkable I have ever seen. It is too soon to speak positively in regard to the structure. I give you this in part from Mr. Wiggans, who has studied this carefully.

The vein is remarkable, first, in this limited outcrop; second, in its continuity in depth, its continued and satisfactory richness, and the promise it gives of enrichment by further veins dipping into it on the foot-wall sides.

Some facts in regard to the product or yield: The ore paid from the surface. The product, or ore, extracted up to this time has been about 80 tons per day, which is sent to the 20-stamp mill, each stamp of which crushes about 4 tons in twenty-four hours. The extraction is chiefly and largely by power drills. A force of 80 men is employed about this mine and mill. The greater part of the labor underground and mining is done by compressed air. The lode, I was told, was 6 to 15 feet wide. This large space permits the use of power drills to great advantage. In the material hoisted there are fragments of the wall rocks, some of which are thrown out, but many pieces pass through the mill. They would prefer to reject most of this wall rock, but it would take more time and expense than it does to mill it, and there is a chance of some of it containing gold. From these 80 tons of rock crushed daily the average product is perhaps \$80,000 worth of gold per month. Some months they have produced as high as \$90,000. The last fifteen days they produced \$13,000 in value. I was present at the smelting, and the gold bar, on weighing, was found to represent only \$37,000, but that made a good-sized bar, weighing some 160 pounds.

The gold is free; very little sulphides are found. There is no concentration, no attempt at concentration, for the saving of sulphurets. The mill is fitted for free milling ore exclusively. The stamps are of unusual weight, 13,500 pounds each, and the arrangements for catching gold are simple. Long silver plates or aprons of continuous sheets of silvered copper for the collection of gold. There are two tiers of these silvered plates at a very sharp incline, and each tier 25 feet long, falling about 1 inch in 8 inches, as about the incline of descent. The gold passes over 50 feet of apron, and most of it is caught upon the silvered plates, with the exception of that which is caught in the battery. After passing these silvered plates of 50 feet, all the tailings, water, and pulp are carried together in an ordinary wooden box sluice, where the current is swift enough to carry off the tailings, but this box sluice is provided with riffles, and it is about 150 feet in length, carrying the tailings to considerable distance away from the mill, and emptying them into a pond, where they are saved. In this long-tailed sluice box some amalgam is saved, for when it is cleaned up, about every month or six weeks, they gather some \$400 or \$500 out of the tail sluices. The gold of this mine is very fine. The bar had a beautiful gold color and was .895 fine. That is about the average of the gold. The alloy consists of a little silver and a little copper, but there is less copper in the gold than there was in the upper portions of the lode, due probably to the fact that as they get the ore from greater depth, less of the copper ore is oxidized ore, and is not reduced by the amalgamation, or not taken up by the quicksilver. The rock is broken by a Blake crusher high up, so as to give extensive bin space, or space above the self-feeders, so the large amount of broken ore can be accumulated there.

Instead of amalgamation in the battery they have a lining of corrugated steel plates of unusual construction. These corrugated steel plates are placed at the back and at the ends of the mortar instead of across and upon the chock block in front. They may be described as a series of steel shelves; the corrugations are in such a form as to catch and retain the amalgam. The effect of this series of steel shelves and corrugations is to catch amalgam and retain it when it is splashed and thrown up in the battery, and it is such an effective retainer of the amalgam that after a month's run these troughs are nearly filled with solid amalgam, and the amalgam may be lifted out in solid bars, like bars of solder. The function, then, of these corrugated plates is to catch the amalgam and prevent it dropping back under the stamps, which saves the wear and breaking up of the gold, and of course saves the loss of the very fine particles of gold which might be carried off by the strong current of water. These corrugated plates are found to work in a most satisfactory way, and to successfully replace the ordinary amalgamating plates in a battery. They are made at the Union Iron Works, San Francisco, Cal.

GEOLOGY OF THE GILA RANGE.

In the region of the Fortuna mine the formations appear to be wholly of mica slate and hornblende slate, with some arenaceous layers like old micaceous sandstones and quartzites. The mine is surrounded by black hornblende slates and mica slates, dipping southward and southwest, at an angle of about 45 degrees, and these slates are very evenly laminated, ridge after ridge. There is apparently a continuous body stretching to a distance of 2 or 3 miles, and showing a thickness at right angles to the stratification of no less than 6,000 or 8,000 or perhaps 10,000 feet, and there is no evidence whatever of plication. The stratification is flat and as regular as the leaves of a book. Usually we detect more or less plication or folding in such a section, but there is no evidence of any folding whatever in this series. There is, however, a great difference in the composition of the layers of these rocky ridges, now all turned black upon the surface, a condition of coloring which seems to attend all the rock outcrops along the lower Colorado, and the origin of which, though discussed by Humboldt after noting similar blackening of the rocks along the Orinoco, has not yet been satisfactorily explained. This general blackening of the surface hides the changes of composition which may be noted by careful and close inspection.

In some places hornblende slates are more developed than the mica slate, and at others the micaceous schistose characters predominate and are accompanied by layers of quartzite interleaved and 3 or 4 feet in thickness, sometimes 3 or 4 inches, and some foliated quartz having little films of mica in it. These quartz beds are members of the series, but have been located as ledges, and it is claimed are gold bearing. The quartz has little or no resemblance to vein quartz, and yet at several points in the outcrop there are stains of green color, apparently from the decomposition of ore like that which has given green stains to the croppings of the Fortuna.

Several dike-like seams or veins of white albite or soda feldspar cut directly across the bedding of the mica slate series. These feldspathic dikes do not appear to have any relation to the ore-bearing vein or lode of the Fortuna. These dikes are extremely irregular and appear to have filled cross fractures or breaks of the regular strata.

Coarse granite was noted at the northern point of the Gila range along the railroad, but no evidences were found of the existence of stratified Paleozoic or Secondary rocks. The mica slate series referred to is the Huronian or Archaean.

COMMONWEALTH MINING COMPANY.

The Pearce Mine.—During the year 1896 this newly developed mine became a large producer. It is another example of the great amount of mineral wealth lying dormant in Arizona awaiting the prospector and the aid of capital. The croppings have been known for years, but being in one of the "lost mountains" of volcanic rock in the Sulphur Spring Valley they were despised and neglected for years, although some hand samples had been taken from the croppings and arranged without any satisfactory result. This is also an example of the fact that samples may be taken from some parts of even a rich lode and not yield anything by assay. Many assays and tests are required to properly ascertain the nature of a mineral lode.

The mine is about 17 miles east of South Cochise station, on the Southern Pacific Railroad. It was bonded in 1895, and was worked until May, 1896, the ore taken out remaining on the dump. It was then purchased by the bondholders at about \$275,000, and shipments of the ore began. The shaft is now about 400 feet deep, and makes a most satisfactory showing of the vein to that depth. Drifts have been run each way from the shaft, and the ore is raised to the surface by steam hoists.

The ore in 1896 was shipped in bulk from Cochise station to Pueblo at the rate of from 4 to 10 carloads per day. The freight rate to Pueblo is \$11.75 per ton. It is stated that the ore so shipped carries from 1 to 2 ounces in gold and from 50 to 75 ounces in silver. A large part of the production is now milled upon the ground, and only the higher grades of ore are sent to the smelters. The stoping proceeds rapidly. Pine timber stulls from 12 to 30 feet in height are required. The mill of the Commonwealth Mining Company, built by Fraser & Chalmers, of Chicago, with a capacity of working 100 tons of ore a day, is well located near the mouth of the main shaft upon the steep hillside, so that there is ample room for the regular fall of the ore and pulp from the tramway to the bins, the crushers, and the successive operations. The ore is first dumped into a large retaining bin, from which it is drawn as needed. Passing first over grizzlies, the parts requiring crushing are fed to Blake crushers of the simple toggle type, but fitted with jaw plates of manganese steel. From these breakers the fine ore, together with the finer from the grizzlies, is delivered through self-feeding appliances to the four Jenish mills, fitted with screens of 60-mesh and having each a capacity of from 18 to 20 tons a day. Each mill is driven by an independent belt. So far, these mills have given great satisfaction and are preferred to stamps.

The product of these mills in 1898 was from 85 to 90 tons a day. The pulp is treated by the pan process in fourteen pans, heated by steam, with seven settlers. About 5 tons of quicksilver are in use. It is lifted into elevated reservoirs and is distributed through the mill by pipes. The bars are cast so as to weigh 1,500 to 1,800 ounces each, and are shipped by express to Aurora, Ill., for parting and refining. The bullion averages .900 fine, and about one-fifth of the value is in gold.

KING OF ARIZONA.

This gold-bearing property, known for a time as the "Gleason," has been transferred to the King of Arizona Mining and Milling Company, a corporation organized under the laws of the Territory of Arizona, with a capitalization of 5,000,000 shares of a par value of \$1 each.

This company owns four full claims—the Homestake, the King of Arizona, the Last Hope, and the Mucho Bueno. The boundaries of the district have not yet been defined, nor has a name been given to it; but when it is organized it will probably be named the King of Arizona district.

This district lies about 35 miles due east of Castle Dome Landing, on the Colorado River. It is north of the Gila River, and about 42 miles from Texas Hill station, on the Southern Pacific Railroad. This is the nearest station on the railway. There are several other locations besides those conveyed to the King of Arizona.

The Homestake location covers the chief workings up to this date. There is on this claim a strong vein of gold-bearing quartz. This lode or vein has three well-marked divisions or layers. On the hanging wall there is a soft layer from 3 to 3½ inches wide, which averages about \$800 per ton in value. Next below this there is a middle layer or body of quartz about 20 inches thick, which will average about \$190 to \$200 per ton in value. The remainder of the vein, so far as it is exposed by the shaft, averages about \$24 per ton. Test holes have been drilled 3 feet deep into the foot wall, and all are in ore.

The shaft by which the exposure of the nature of the vein has been made was 50 feet deep in July last, and followed the dip of the vein. From this shaft at the bottom drifts have been run along the vein under the hanging wall a distance of about 40 feet westerly, and easterly about 20 feet, making, including the length of the shaft, about 70 feet of driftage on the lode and showing a continuity of vein having the same characters and values developed by sinking the shaft.

The hill rises rapidly on the western side of the shaft, so that the height of backs on the lode above the drift is greater on the west than on the east. At a point about 30 feet west of the shaft and on a level with the collar of the shaft the vein has been crosscut from wall to wall and is shown to be 18 feet wide. The ore in this crosscut has about the same grade as that at the collar of the shaft. The value of the vein at the shaft has been estimated at \$3,500 per lineal foot, longitudinally. The vein is exposed for 18 feet or more above the shaft. The croppings of the vein may be followed for some 750 feet up to a second opening known as the "King of Arizona shaft." This was 13 feet deep in July. By means of drill holes the vein was shown to be over 11 feet wide and to average \$12 per ton in value. A tunnel has been started in to tap the vein about 90 feet below the croppings.

There are several large croppings of quartz near the workings on the "Homestake," and probably a dozen or more other locations in the vicinity.

At present the quartz is taken by teams to a 5-stamp mill and a 2½ Huntington mill at the Gila River near Mohawk station. This is 35 miles south of the mine and 10 miles north of the railroad. Texas Hill is the nearest railroad station, the mine being about 42 miles north of that station.

On the 1st of October, 1897, this mill had run about fifty full days of twenty-four hours each, and about \$30,000 worth of gold had been taken from the plates. About 75 per cent of the assay value is extracted.

Boring for a water supply is in progress at the mine, under arrangements to go down 2,000 feet. If these efforts fail to develop sufficient water to supply a 50-stamp mill, a narrow-gauge railway will probably be built from the mines to the Gila River and a 50-stamp mill will be erected there. If water is found at the mine, the mill will be erected there.

Wood is sufficiently abundant at the mine and at the mill on the Gila. It is chiefly mesquite and iron wood, and costs from \$3 to \$3.25 per cord, delivered.

The contract price for hauling ore from the mine to the mill on the Gila is \$8 per ton of 2,000 pounds. Contracts have been made for the erection at the mill of a plant to treat the tailings by the cyanide process.

The following statement made from an authoritative source in March, 1898, and published in the Yuma Sentinel, gives additional information concerning this interesting property:

"The mines of the King of Arizona Company in the Shorthorn Mountains, the discovery of which was the most sensational strike in Arizona, or anywhere else,

for many years past, are continually producing a sufficient quantity of wonderfully high-grade ore to keep the 5-stamp mill at Mohawk in operation. Sinking in the main working shaft on the Homestake claim goes steadily on, and at a depth of 140 feet from the mouth of the shaft, which is itself in a gully and 150 feet beneath the apex of the hills that rise on either side and through which the ore body runs, ore has been reached. The bottom of this shaft is now in ore that mills about \$400 to the ton—not unusual ore for this mine. The 80-foot level has been run west from the main shaft about 50 feet, and rock worth from \$600 to \$700 per ton is now being taken out. Stopping has not yet been begun on this level, but probably will be soon. The grade of ore taken out of it is even higher than the majority of the rock taken out above from the 30 and 50 foot levels, on which the mill has up to the present time been run and made records that have excited the wonder of the mining world. The 80-foot level has also been run east about 40 feet to connect with a tunnel running west from the other side of the mountain. The ore in the 80-foot level east is the low-grade ore of the mine, and gives from \$30 to \$40 per ton. The tunnel running toward it from the other direction has tapped a large ore body containing \$75 rock. From the standpoint of a mining man the mine is now in better condition than it has ever before been, and is being developed systematically. The final system of working the ores of this group has not yet been determined upon, but it is not unlikely that a tramway will be built to Texas Hill, 30 miles away, and a 40-stamp mill erected at that point, where water and wood are plentiful. That this will positively be done has not yet, however, been decided, reports so stating which have appeared in other Territorial papers notwithstanding. The idea of placing the mill at the mine and pumping water from the Gila is also being considered. In the meantime boring for water continues, and a depth of 5,000 feet has been reached. The same formation as that in which water was found at Castle Dome is being penetrated, but no signs of water have appeared. No discouragement will be entertained by the company, however, and sinking will be continued until water is found, no matter where that may be."

OTHER MINES AND PROSPECTS NEAR YUMA.

The discovery by Gleason and the important developments following greatly stimulated prospecting in the mountains north and south of Yuma and eastwardly from the Colorado. The field is a rich and promising one. The great drawback is the absence of water, or its extreme scarcity. The existence of very fine gold-bearing rock up and down the Colorado River has long been known, and early excited the attention of prospectors. Much search has been made for the ledge supposed to exist called the "Lost Squaw Mine," from which it is said large nuggets of gold were brought in by an Indian squaw, who refused to disclose the locality and who suddenly disappeared without leaving any clue to the place where she obtained the gold.

Near Castle Dome, not at the landing but at the mines, Mr. W. P. Miller, the former owner and superintendent of several of the mines, made locations upon crop-pings of a copper ledge, or seams, in which gold could be often seen in large grains and flakes. Along the Colorado River at and beyond La Paz great quantities of ferruginous "float" rich in gold were found by Ehrenberg and the early explorers. The copper conglomerates of the Planet and other claims, elsewhere noticed, carried coarse gold.

GOLD ROCK.

Among the several mining enterprises attracting attention at Yuma, the Gold Rock merits mention. It was closed down with an indebtedness of upward of \$200,000, but it has been revived by Mr. Stewart, according to report, and the debt has been nearly paid off. There are three claims, known as the Queen, the Crown, and the Cross, about 30 miles west of Yuma.

MORENO (NOW GUADALOUPE).

After lying idle and neglected for several years, work has been resumed upon this property, and the ore is being worked in the Ingersoll Mill at Tyson's Well.

FREE-GOLD DISTRICT—COLORADO RIVER.

To the gold-bearing region along and near to the Colorado River, in Yuma County, north of Silver district and of the old Clip Mine it is proposed to give the name "Free-gold district," from the fact that an abundance of free gold is found there on and near the surface. This district is from 2 to 3 miles wide and 5 miles long. One end is about 4 miles from the Colorado River. The old Yuma road passes near it. It is

east of the old Celestine arrastre. The rocks, according to Mr. Sparks, are granitic, porphyritic, and volcanic. These rocks are traversed by quartz veins. There is no development yet beyond a depth of 150 feet. One claim, the Golden Chimes, has a vein, according to R. W. Sparks, who has prospected there, from 4 to 8 feet wide, with some 50 tons out on the dump, which is expected to average from \$35 to \$40 per ton.

SILVER VALLEY GOLD AND SILVER MINING COMPANY.

This property, about 40 miles south of Kingman, in the Hualapai Mountains, Mohave County, has two or more gold-bearing veins, the quartz from which is worked in the company's 15-stamp mill.

MOHAVE COUNTY MINES.

There are many gold-mining enterprises in Mohave County about which little is known. The gold placers of the Chemehuevi Mountains have long been worked by the dry-washing methods. Banks of auriferous gravel are found along the Colorado River north of White Hills. The White Hills mines were discovered in 1892, and a large amount of money has been expended in their development. There have also been extensive mining operations at Chloride and at Cubab and Todda Basin. Important discoveries of copper ore are reported from the region of Mineral Park, and ledges of the gem, called "chalchihuitl" by the Aztecs, have been located. This is known to us as turquoise, and these localities appear to have been worked by the aboriginal races long ago.

MAMMOTH-COLLINS, LIMITED.

This property, which at the date of the last report was lying idle, owing to a change of ownership, has been reorganized, and work has been resumed upon it under the above title. In addition to the Mammoth lead the company recently purchased from George N. Fletcher the Collins group of mines, which run parallel to and join the Mammoth on the west, and the company as now organized is called the Mammoth-Collins Mines, Limited.

Owing to their proximity to each other the entire group of mines will be worked from the present Mammoth shaft, which is already down to the 500-foot level.

A wire-rope transportation plant has been put up by which the ore from the mines is taken direct to a mill on the San Pedro River, and the returning buckets take back all the water required at the camp.

A cyanide-leaching plant is now being placed so as to work the tailings.

Portions of the dump are being worked for the large quantities of coulferrite—the molybdate of lead—which they contain.

The granitic rocks of the Dragons, on the west side of the South Pass leading from Tombstone over into the Sulphur Springs Valley, are gold bearing. These granitic rocks are traversed by gold-bearing quartz veins. From some of them ore has been shipped away to advantage, but no milling has been done on the ground. Dr. Rider and others have worked these veins for a long time. Scarcity of water renders the working difficult. Water is obtained in wells at the cattle ranches at the entrance of the pass on the west, and in the granite formation not far from the summit.

SOUTHERN BELLE.

An extensive ledge in the Old Hat mining district lies upon the northeast slope of the Santa Catalina Mountains. There are many locations upon the lode, some of which are patented. It has the form of a "blanket ledge," lying quite flat, dipping only about 7 to 10 degrees. It comes to the surface along a deep canyon, which has cut down into the rocks and reveals an extensive formation of red sandstone and quartzite, probably of Cambrian age. The ledge varies from 18 inches to 5 and even 10 feet in thickness, and has been extensively worked. The quartz has been crushed in a 10-stamp mill at the canyon. It is difficult to ascertain the yield, as no reports have been made public. The gold is free, and is caught upon plates and in the battery. The mine and mill were leased to Mr. Wemple, of New York, in 1897. Some hand samples taken from adjoining claims upon the same ledge showed free gold and gave about an ounce per ton by assay.

This ledge appears to be very near to the contact of the red shale and quartzite, with a heavy dike of dioritic rock below.

GULJAS MOUNTAINS—BENT & SAMPSON.

Messrs. Bent & Sampson have been active during the past ten years or more in developing locations made by them in the Guijas district. Several sales of claims

have been reputed as made by them. Among these the Grant group was transferred to other parties, and there is promise of the erection of a suitable mill at the camp.

ORO BLANCO GOLD-MINING DISTRICT.

Oro Blanco district receives its name from the fact that most of its placer gold is so largely alloyed with silver that the yellow color of the metal is lost and the gold is nearly white. A large part of the product is not over .400 fine.

The district is situated in the southwestern portion of Pima County, and is bounded southerly by the border line of Sonora, Mexico, into which State the gold-producing formations extend. It is more than 10 miles square, and consequently the district has an area of more than 100 square miles. All of this territory is gold bearing. It has long been known for its white gold placers and has been considerably prospected, but there has not been any serious or extensive development work. It is said that Mr. C. W. Kempton, mining engineer, who visited the district, remarked that, considering the extent and highly mineralized surface, it has been less developed by workings below the surface than any other mining section in the country. The district is accessible from Tucson by a triweekly stage. The roads are generally good. The rock formations are generally granite and porphyry with argillaceous slates. These formations seem to be everywhere gold bearing. In almost every ravine or gulch gold can be found by panning, and even on the hillsides and on the surface generally, especially where the soil is reddened by decomposed pyrite, gold can be obtained by dry washing. Most of the placer mining is carried on by Mexicans in a crude and desultory way, often with a small and wholly inadequate water supply, and in certain places by dry-washing machines worked by hand. The returns are small, but the miners manage to get their living, especially when they can get water.

Not only gold, but silver, lead, copper, and iron ores are found in different portions. Gold is, however, the most generally diffused metal, but follows chiefly a broad belt or line through the district. The chief gold mines are found along this belt. The chief mines or claims are known as the Oro, Nil Desperandum, Sorrel Top, Tres Amigos, Holden, Gold Bug, McClenahan, Esperanza, Rob Roy, Golden Eagle, with many other locations and prospects, on several of which work is now being prosecuted.

Another part of the district seems to carry silver as the metal of dominating value, although more or less gold is associated with it. Owing to the depressed value of this once precious metal, less attention is now given to this silver-bearing portion of the district than formerly, and most of the claims are not worked.

Argentiferous lead ores are found also, but at present prices of lead and of silver the deposits are not explored. Copper ores are also found. A locality near the Jalisco range of mountains was worked for this metal with its associated gold and silver some years ago. Some lots of ore assaying as high as 37 per cent of copper and 18 ounces in silver have recently been taken out.

It is not possible to obtain definite and exact figures of the previous metal product of this section, but the foregoing list of the principal mines and prospects is believed to include those from which bullion or concentrates in larger or smaller amounts have been shipped during the past year.

Several mills have been erected in this district, but there is not anywhere a shaft or mine 300 feet deep. The Montana is probably the mine upon which most work has been done since its location in depth and by drifts, crosscuts, and tunnels. The ore carries gold, zinc, and some copper. Since the death of its principal owner, Mr. Diaston, of Philadelphia, the mine and mill have not been worked.

In the opinion of Dr. A. H. Noon, one of the old residents of this district, and to whom I am indebted for most of the foregoing information, the Oro Blanco section of the mining district of the Territory constitutes a rich and inviting field which is now receiving increased attention. The Old Glory mine has been worked intermittently with variable results. In the month of February, 1898, it was reported that work on the Old Glory still continues and daily demonstrates that the property is a paying one under capable management. The mine contains large bodies of low-grade ore, but none so low that a profit can not be made if judiciously handled. This is evidenced by the results obtained by Mr. Gould.

It was also reported that the Tres Amigos property continues to be worked for development purposes, some very high-grade gold ore being found in the progress of their work. This is sorted and shipped, the last shipment yielding a return at the rate of over \$500 per ton.

VULTURE MINE.

This well-known gold mine is one of the oldest in the Territory. Its fame in early days was based upon its great production of the yellow metal and the difficulties under which the gold was obtained. Some of the greatest of these obstacles were the absence of water and the presence of the savage Apaches and the distance from

civilization and supplies. Sold originally by Weaver for an old pipe, it repaid the purchasers by millions of dollars' worth of the precious metal. Without banks upon which to issue checks to pay the man and without means of transporting coin to meet the pay rolls, the ingots of gold were chopped up with hatchets and chisels and distributed to the men in liquidation of their wages. Yet the property has seen dark days, and has at intervals stood idle, while not one of the shafts had been sunk much more than 300 feet. A victim of extravagant valuations and promises based upon its past record and of stock-jobbing exploitations, the proper working and development of the property have been neglected.

The vein at the surface was divided up into parallel layers, which were more or less broken over and dislocated. These trifling displacements were sufficient to frighten some of the weak-kneed, grass-root miners, and gave rise to the fallacious saying in California that the "veins in Arizona had no roots." But these little breaks have been passed and only serve to show the great breadth of the lode, and to indicate the best position for more extensive and deeper work. Instead of some 400 feet of depth, as now, a shaft should be put down 1,200 feet or more, with proper drifts and connections with another shaft farther west.

The property changed hands early in the year 1898, and it is hoped will now be worked upon its merits.

It is understood that the cyanide plant erected upon the banks of tailings has been successfully run during the year.

GOLD ON THE SAN FRANCISCO RIVER.

Extensive placer deposits are found along the San Francisco River about 7 miles above Clifton. It was proposed some years ago to work these banks of gravel by the hydraulic process, and a large sum of money was expended in sending out sheet iron for a pipe line and a machine plant to bend and rivet the sheets into pipe. The want of adequate fall and space for the tailings caused the abandonment of the enterprise.

A group of gold bearing veins on the right bank of the river some distance above the placers gave promise of profitable working, especially as the water of the river was abundant for milling purposes, and the conditions were favorable for cheap working.

In March, 1898, it was reported that the Evans-Vanhecke Gold Company was running a 20-stamp mill regularly on ores from veins in the district, and that it was the intention to increase the plant by the addition of thirty more stamps.

ROCHESTER GROUP OF GOLD CLAIMS, CABABI DISTRICT.

The following memorandum notes were made during an inspection in 1896, since when much work has been done on each of the claims:

Great Eastern.—Quartz ledge, trends N. 50° E., dips easterly 70 to 75 degrees. A white quartz at croppings. Has the appearance of quartz which often carries coarse gold. Pit about 25 feet deep. Vein over all about 48 inches wide. Sixteen inches of quartz on the hanging wall and 12 inches on the foot. Walls soft and clay-like. Color, light gray. Some galena seen.

Grand Central.—About 1,000 feet higher than the camp on the west side of the mountain. Red and gray volcanic or plutonic rocks porphyritic. A "blind ledge," almost in the midst of a large amount of blue clay and decomposed porphyry. When oxidized the iron oxide becomes ochery yellow. This lode shows free gold. Course of vein is N. 30° to 40° W.; dip southeast at angle of 46 to 66 degrees. A shaft was about 100 feet deep. The clay at the bottom quite damp. Thickness varies, at one place 4 feet. Advised cross-cutting to the west. Some 30 to 40 tons out on bank.

Grand Mogul.—Several ledges and spurs, on a narrow ridge between two gulches or arroyos. Rock is red porphyry. Little or nothing done on the croppings. A tunnel started below them.

Little Buckhorn.—A bulging vein. Trend N. 30° W., S. 30° E. Dip east. From 18 to 24 inches wide.

Big Buckhorn.—On the top of a ridge. A quartz vein trending N. 40° W. Dip is easterly 75 to 80 degrees. Fine "ribbon" quartz. Walls have a soft gouge. There are some stains of copper. This vein can be cheaply mined.

M'DUFFIE CLAIMS.

Mr. W. C. McDuffie, of Tucson, has a group of gold-bearing claims near Rochester's camp in the Cababi mining district. These are quartz lodes varying in width from 18 inches to 6 feet, carrying free gold and some galena.

KUHN-KAHN.

This claim covers a well-defined gold quartz ledge traversing porphyritic rock about half a mile west of the Huntington or Desert well, near which there is now a Papago village. This vein averages about 20 inches in thickness and carries about \$12 in value in free gold. Several tons worked as a test at the Arizona School of Mines yielded more than this, and assays have indicated as high as \$15 to \$20 per ton. There is considerable heavy carbonate of lead present. The developments consist of shafts and open cuts of no great depth.

GOLD IN THE HUACHUCAS.

Increasing attention has of late been given to prospecting for gold-bearing veins in the Huachucas, particularly about Tanners Canyon. Many claims have been located. Mr. P. J. Hand, of Lochiel, has sunk 50 feet on one of his claims. Good placer ground is reported to exist in the vicinity of the Harper mine, and good wages have been made by miners working these.

FRESNAL GOLD MINES.

The discovery of remarkably rich gold and silver ore on the western side of the Baboquivari range of mountains, southwest of Tucson, has been one of the most notable events of the year in mining circles of this Territory. The samples brought in for assay at the Arizona School of Mines show free gold and rich silver ore. The combination is very promising, and the samples frequently assay as high as \$1,000 to the ton, but this is upon picked hand samples. Some of the hand-worked ore, as sacked for shipment, has, however, run as high as \$600 per ton.

The veins were discovered by Henry Wicks and J. D. Burrow, prospectors, associated with the Allison Brothers, of Tucson. The discovery is one of the results of the system of making reliable assays at the Arizona School of Mines for a nominal sum, as established by the legislature. Mr. Allison systematically sent in samples from croppings for assay, often getting nothing to encourage him until the prospectors came across the croppings of this ledge. Mr. John Brockman, of the Pearce or Commonwealth mine, has purchased Mr. Burrow's interest in this property, and active mining operations are expected will be commenced without delay. Considerable shipments of high-grade ore have already been made.

This discovery has stimulated the active prospecting of the Baboquivari Mountains, and many other locations have been made.

GOLD FIELDS—SUPERSTITION MOUNTAINS.

The broad, open area in the midst of the Superstition Mountains, east of Mesa, and described under "Geology," is known as "Gold Fields." This name has been given to the district because of the many gold mines, claims, and prospects, and the very general distribution of the precious metal in the granite rock which forms the floor or bed rock of the district. Much of the gold appears to be derived from the granite near the contact of plutonic dikes and without any well-defined quartz vein. The impregnation with gold is seemingly from the decomposition of iron pyrites, which on decomposing leaves a large amount of red iron oxide behind. It is claimed that gold can be washed out of the red soil found abundantly over the surface of the hills. There are, however, several well-defined quartz veins, and some in close connection with the contact of the granite with strata of ancient Palaeozoic limestones, portions of the sediments which covered the region before the irruption of the granite.

One of the most important mines has been worked by Captain Hall for several years past.

Mammoth.—This claim is along the contact of the granite with a porphyry dike. This contact is plainly marked by a very heavy mineralization of the granite with red oxide of iron derived from the decay of pyrites. The mine has been extensively worked to a depth of 100 feet, and is reputed to have yielded gold to the value of nearly a half million dollars.

Other claims are known as the "Bull Dog," the "Mabel Ann," and "Gold Fields."

The following are the results of assays of some of the hand samples taken from claims in Gold Fields district:

Mark.	Silver, per ton of ore.	Gold, per ton of ore.	Gold value, per ton of ore.	Where taken.
	Ounces.	Ounces.		
No. 1	3.20	0.066	\$1.36	Mabel Ann shaft.
No. 2	3.70	.250	5.16	Mabel Ann dump.
No. 3	2.50	.233	4.81	Mabel Ann main shaft.
No. 4	2.80	.066	1.36	Mabel Ann north shaft.
No. 5	2.00	.083	1.71	Mabel Ann tunnel.
No. 6	1.80	.066	13.76	Gold Fields.

GOLD IN GILA COUNTY.

Commissioner of Immigration W. P. Hunt, in his report for 1897, says that the northern portion of Gila County is rich in gold. Three small stamp mills were working. The Craig mill produced 162 ounces of gold, valued at \$2,754, and the Coleman mill turned out 724.47 ounces, worth \$12,621.99—a total of \$15,375.99.

GOLD MINES IN THE BRADSHAW MOUNTAINS.

Space does not permit of a full description of the many claims and mines which have been located in these mountains.

Most of the gold-bearing lodes carry a large percentage of sulphides of iron. The Crowned King is an example and is one of the most prominent claims.

Crowned King.—This claim owes its prominence largely to the persistent enterprise and energy of one of its principal owners, Mr. Shekels, of Prescott. It has been successfully worked for several years. The vein is strong and thoroughly well metallized. Wood and water are abundant. In 1896 the ore was worked in a 10-stamp mill near the mine. As much of the free gold as is possible is collected upon the plates and the pulp is then concentrated on eight Frue vanners. The concentrates are shipped away to smelting works. No report for 1898 has been received.

Luke mine.—This claim is about 2 miles south of the Crowned King. It was formerly known as John Luke's. It is considered to be the extension of the Lorena, or to be on the same lode. In 1896 it was worked by seven men and produced about a carload of ore a month. The ore is packed out of the mountains and then hauled by wagon to Phoenix. There are three veins in the group, the Lorena, Cougar, and Eclipse. The shaft on the Lorena was 300 feet deep, with three levels. The Cougar and the North Cougar yield considerable blends in nodular masses.

These veins are near Mount Wasson, one of the highest, if not the highest peak of the Bradshaws, and named for John Wasson, formerly United States surveyor-general for Arizona. This mountain, a noted landmark in Arizona, is erroneously lettered "Mt. Watson" in the last issue of the United States Land Office map of Arizona.

Junior's mine.—This claim, near Mount Wasson, in the Bradshaws, is upon a large vein near the outcrops of a porphyritic rock similar to that seen at the Grey Eagle claim on Humbug Creek, farther east. It is opened by a shaft which, if the claim is not being worked, is filled to overflowing with water, with which the rock formations are charged. Mr. Junior has taken very rich silver ore from this claim.

Rapid Transit.—This is a pyritic vein with gold and silver ore. It was formerly owned and worked by Jake Herickles. It is about 2 feet wide; elevation about 5,700 feet. From this claim the trail ascends a steep granitic mountain by zigzag turns to Junior's, nearly 1,000 feet higher.

Grey Eagle.—On the left or east side of Humbug Creek, in the line of prolongation of Junior's claim, and supposed by some to be on the same lode. It is a large quartz vein carrying pyrites and gold. Its average is "low grade," but the vein is large and strong, and it has been opened by several tunnels from which good ore has been taken. It is in slate rock alongside of a dike of greenstone porphyry in which the crystals of feldspar are distinct. The quartz is from 2 to 10 feet thick, and most of it is very rusty from the decay of the pyrites.

Oro Bella.—A claim 1,500 feet upon the pyritic quartz lode adjoining the Oro Benito, which crosses the gorge of Humbug Creek a short distance below the Grey Eagle. It is a well-defined lode, which traverses slate parallel with the bedding and crops out the whole length of the claim, for most of the distance upon the steep side of the mountain above the Oro Benito, permitting it to be opened by tunnels. This vein is from a few inches to 4 feet thick. In places it is divided into two or more branches. The ore consists chiefly of white iron pyrites, with a central layer of copper pyrites and some galenite. The freshly broken ore is very brilliant and beautiful and is an ore which can be easily concentrated. The decomposed surface ore—the rusty croppings—was rich in gold—free gold—which could be seen by the naked eye, and showed very well in a pan. Most of this ore was worked in arrastres on the creek just below. The claim was reported to have yielded in this way from \$50,000 to \$60,000 in value of gold. The outcrop is easily traced by the open cuts and pits from which this ore was taken.

Oro Benito.—This claim, also of 1,500 feet, is upon the same lode as the Oro Bella, and the claims are continuous. The same observations as those upon the Oro Bella will apply here, except that the Benito was first worked, the lower tunnel being at the creek level and has been more extensively worked than the Oro Bella. A mill was erected by a New York company a few years ago, but for some inexplicable reason the enterprise does not appear to have been attended with success. It would appear that concentrates from ores which paid so well to work at the croppings should pay well for smelting.

UNION MINE—MINNEHAHA.

A claim called the Union, located by Mr. Ferris, of Minnehaha Flat, in the Tiger mining district, upon a quartz ledge in the valley, is said to prospect well in gold.

It furnished gold quartz for arrastres as early as the year 1874-75 and is said to have yielded as high as \$20 per ton for selected rock. The ledge in places attains a width of 4 to 5 feet and is at or near the plane of contact of granite and mica slate. Water and wood and pine timber are abundant.

MINES AND MILLS OF YAVAPAI.

The county immigration commissioner of Yavapai wrote as follows in 1896 regarding the mineral wealth and gold production of the county:

"Our silver mines have a grand record, and ore is being steadily shipped. The Silver Belt has produced \$600,000 in silver and Dos Oris \$600,000; the Peck, \$3,000,000.

"In the Big Bug district two large smelters are running on copper ores. A 20-inch gauge railroad connects the two mines with the smelters. The Bradshaw Mountains are full of gold, and the Crowned King is one of the greatest gold producers in the Territory. The Del Paco, in this district, has produced a quarter of a million dollars in gold. Eleven thousand dollars were taken out from a clean-up of one month's run of an arrastre. The mine is still worked. Stage lines ply regularly between these camps and Prescott, and most of the camps have post-offices. There are many creeks and rivers, and much of the placer gold comes from these streams. Water is found in abundance from 20 to 60 feet from the surface. There is in the Big Bug district a 320-acre deposit of translucent, sea-green onyx, solid from 10 to 30 feet deep. Lime rock, which affords first-class lime for all purposes, is abundant.

"On Sycamore Creek are vast deposits of lithographic stone, pronounced equal to the Bavarian article. There are also quarries of serviceable marble and any amount of building granite and several colors of building sandstone. Great slate dikes lie to the east. On the Verde are large salt deposits, which carry a very large percentage of soda.

"In 1893 the gold output of Yavapai County was \$339,740; in 1894 it was \$867,840; in 1895 it was \$1,258,851. In 1894 the silver output was 256,931 ounces, and in 1895 it was 322,036 ounces, and the output of both metals is still on the increase."

Fremont claim.—On Groom Creek, 6 or 7 miles south of Prescott, in Yavapai County. A small but continuous pyritic gold-bearing quartz vein from 6 to 12 inches wide, with some 3 feet of soft, decayed wall rock on one side. It is nearly vertical in a clay-slate formation, near a dike of greenstone. It has been tested for gold along the outcrop for 1,000 feet or more. The croppings are spongy ferruginous quartz. The top of the hill through which the vein cuts is about 100 feet above the lowest point at which the vein is accessible in the creek.

Arizona Queen.—This is one of a number of small veins of gold-bearing quartz, not far from the Fremont. It crops near the house formerly occupied by Mr. Clark and partly under a mill for working the ore.

Chataqua and Yellow Jacket.—These gold claims, formerly known as the Golden Star, were examined by me in 1886. They are in the foothills north of Phoenix, about 3 miles west of Cave Creek, and at an altitude of about 5,000 feet above tide. A large quartz vein here traverses a mountain of slate which overlies granite. It may be called a blanket vein, for it lies at a low angle on the north side of the mountain, conforming to its slope and only a few feet below the surface. Its position relatively to the rocks and to the topography is much like that of the Leviathan at Stanton or Weaver. The outcrop is bold and strong and forms the crest of the hill in large white masses. The rock is low grade, but is very abundant and in some fragments free gold was found. The vein carries considerable pyrites, estimated at over 2 per cent. In places the vein is subdivided. It has been partially prospected by a shaft and cuts, but, compared with the extent of the vein and its proximity to the surface for some 1,200 or 1,500 feet, very little has been done and little was known of this property. The remains of a mill fitted for pan amalgamation indicated a probable failure to work the sulphides, as might have been expected. Remains, also, of arrastres indicated that good quartz carrying free gold could be selected from this lode.

A spring of water breaks out from the side of the mountain about half way up above the valley.

Contention.—A claim on stringers of quartz in a soft decomposing granite on the road from Phoenix to Cave Creek. The formation bears sulphurets and free gold over a breadth of about 3 feet.

Bullwhacker.—A small gold mine in Yavapai County, about 4 miles from Prescott, sometimes called the Boulder claim. It is notable for bearing coarse gold of high grade in a small quartz vein. The vein varies in thickness from a few inches to a foot. The quartz is hard and occurs in boulder-like masses, rounded, hard lumps, in which the gold occurs. There is apparently one ore chute or chimney pitching northward. The claim has been worked to a depth of 132 feet by a shaft and most of the pay ore extracted (1886) to that depth. This vein is well situated for working, but there is no water convenient to the mine.

Mammon mine.—The Mammon gold mine in Pima County is located in the Casa Grande mining district about 30 miles southwest of Casa Grande Station on the Southern Pacific Railway. It has been prospected by Colorado and Eastern capital. The vein has been opened, a 20-stamp mill erected, and water has been introduced from wells in the valley some 2 or 3 miles to the westward, it being pumped up by steam pumps at the well.

The vein of auriferous quartz is from a few inches to 4 feet in width, and traverses slate rocks diagonally across the bedding in such a way as to form a series of bunches or enlargements connected together by narrow seams or stringers. Some of the ore is rich and shows gold freely. The surface ore is free milling.

GOLD REGION OF SONORA.

The adjoining State of Sonora in Mexico has an extensive gold field which trends northwestward parallel with the shores of the Gulf of California across the boundary line into Arizona.

From Yuma eastwardly to the Baboquivari Mountain range a constant succession of mountain ridges, separated by broad valleys or plains, marks the prolongation northward of this gold region, a gold region of great extent and importance, characterized by a multitude of strongly-defined quartz veins, following the trend of the mountains and fringed by placer deposits of great extent.

There are two especially well-defined gold-bearing mountain ranges—those of the San Francisco, south of Sonoyta, on the boundary line, and west of El Plomo, Sonora, in which, along the contact between granite and porphyry on one side and a heavy quartzite formation on the other, a large quartz vein extends for miles, and deserves the title of the mother vein of Sonora. Two of the chief locations upon this vein are known as La Campana and the Alejandro. This same trend of gold-bearing formation extends northwest into Arizona. East of this line and north of the boundary we have the gold-mining districts of the Quijotoas and the Cababi ranges, all gold-bearing.

Several of the gold mines in this Mexican field—contiguous to our boundary and more readily accessible from Tucson and points upon the Southern Pacific Railway than from Mexico—have been located under the Mexican laws and are worked by American and English capital.

The Campana, located by J. M. Lepeda, of Altar, Sonora, and Tucson, and by L. H. Manning, of Tucson, has been taken over by an English company and is now under active development. For a long time the only dependence for water was upon a well sunk in the gulch, the supply from which was inadequate to the work of the mill and the capacity of the large quartz ledge, from which a hundred tons a day can readily be mined. Water is now to be brought in by a pipe line from Zoni, some 7 or 8 miles northward.

The title of the English company is The Campana Consolidated Gold Mines, Limited. The property was visited by two of the directors, Mr. A. W. Stoenmont and Mr. W. T. Todd, who were enthusiastic on their return upon the prospects of the company. They have had considerable experience in mining matters in South Africa and Australia. Comparing Sonora with South Africa, they say that the Campana reef resembles the Randt in many respects, and that the extent is quite equal to that of the Randt in its early days. Sonora has many advantages over the Randt, principally in its abundance of fuel, its facilities of access, its magnificent climate, and the cheapness of labor. The width and quality of the reef resembles the Randt mines almost exactly, most of the best paying South African mines having paid well on low-grade ore in large quantities. Comparing Sonora with West Australia, they consider that the former is to the front on all points. They are confident that Campana Consolidated has a great and prosperous future, and cabled the English shareholders to that effect, and spoke of the management of General Manning in highest terms.

The Alejandro.—This location is upon a quartz ledge of great extent and thickness which crops boldly out on the western side of the same range upon which the Campana is found. The quartz is granular and crystalline, and ranges in thickness from a few feet to 12 or more. It has not been much prospected, water being absent. There are several little pits, one or more showing free gold well distributed. The grade is low but the quantity of quartz seems unlimited, the croppings rising in places to a height of over 15 feet.

There are many other powerful ledges in the region, and old placer pits attest that they are gold bearing.

A railway to the gulf might solve the problem of working some of these great lodes which seam the mountains in all directions.

El Mendo.—This is the name of a location 12 miles north of the Campana mine, on the same drainage, bordering upon a great wash or dry waterway, except at the time of rains. The vein is formed of gold-bearing quartz from 2 to 5 feet in thickness, or

it will average 2 feet. It is about 4 miles from the water at Zoni. There are two shafts upon it 70 feet deep. About 7 tons tested at the Campana mill yielded \$8 per ton on the plates, the gold being free. Ten tons more gave between \$4.50 and \$5 per ton.

San Marciano, another quartz reef in the same district with the El Mundo and the Campana, prospects well in free gold, but has not been worked to any great extent for want of water.

San Manuel.—This claim, well known in the annals of northern Sonora as a producer of rich gold ore suitable for arrastreing, is about 6 miles south of El Plomo. The vein is beautifully formed and regular, the richest portion consisting of iron pyrites associated with quartz, but the pyrites form the chief bulk and weight of the ore. It traverses, in a nearly vertical plane, an outcrop of a peculiar black aphanitic quartzite of very fine grain, and itself pyritic and gold-bearing, though in a less degree than the medial portion or vein proper. This medial pyritic vein varies in thickness from a few inches at the end to 2 or 3 feet. It has been opened by shafts to a depth of — feet, which show the vein to be continuous and strong. Assays of samples taken across the vein at different depths show from half an ounce to 1½ ounces per ton of ore. The oxidized croppings of this ore were worked by Señor Jesus M. Lepeda, at El Plomo, Sonora, in arrastres driven by steam, and averaged over \$16 per ton in value.

La Abundancia.—An auriferous and argentiferous lead ore at El Plomo on the right bank of El Plomo wash. The fame of this lode as a producer of silver lead, which was largely mined to be used as a flux for other ores, extends throughout Sonora. The croppings of quartz, studded with the pits and cavities left by the decay of pyrite, give good prospects in gold. The lode is large and well defined and extends a great distance. The workings are of little depth, but a large amount of fine lead ore has been taken away from one of the main ore chutes.

THE SAN FRANCISCO GROUP, SONORA.

A group of gold-bearing quartz veins in the San Francisco Mountains has been worked for several years by Mr. Levy, of Santo Domingo, on the Sonoyta, a few miles beyond the border line at Quito va Quito. This place and Levy's mines are most readily accessible from Gila Bend Station, on the Southern Pacific Railroad, by way of the Ajo or of Sunright.

The veins are all well formed and persistent. They carry free gold. The chief difficulty is the scarcity of water, which, though abundant on the Sonoyta at Santo Domingo, is not found at the mines. The construction of a railway from the mines to the water has been proposed. If such a road could be built it might be extended so as to draw supplies of gold ore from other sources. The day probably is not far distant when rail communication from Gila Bend or Tucson will tap all the chief mining districts along the several ranges of mountains in western Sonora and give cheap transportation of the ores to some convenient point on the Gulf coast where fresh water can be had as well as supplies by sea.

The following results were obtained by working tests upon bulk samples from the principal claims of the San Francisco group:

Number.	Quantity worked.	Weight bullion.	Value per ton of 2,000 pounds.
<i>1. Piedras Negras.</i>			
	Ounces. ¹	Ounces. ²	
1	16	0.036	\$2.84
2	12	.120	11.828
<i>2. San Francisco mine.</i>			
3	32	.0085	.30
4	16	.0485	1.50
5	27	.078	8.27
6	16	.020	1.42
7	16	.019	1.34
8	48	.550	12.96
9	32		
12	16	.360	25.40
13	16	.720	51.68
14	16	.238	16.45
<i>3. La Reina.</i>			
16	16	.295	20.68
17	32	.035	1.24

¹Avoldrupols.

²Troy.

Number.	Quantity worked.	Weight bullion.	Value per ton of 2,000 pounds.
<i>4. Santo Domingo mine.</i>			
	<i>Ounces.¹</i>	<i>Ounces.²</i>	
20.....	16	.060	8.00
21.....	56	.062	1.06
22.....	32	1.720	51.60
23.....	16	.005	.30
24.....	48	.160	8.19
25.....	32	.055	1.65
26.....	16	.425	25.50
27.....	40	2.040	49.00
<i>5. Santa Rosalia.</i>			
18.....	16	.720	43.20
19.....	48	1.565	81.30
20.....	16	.275	16.50

¹ Avoirdupois.² Troy.

An average of 251 ounces of San Francisco ore gave 3.816 grains of gold, indicating value at rate of \$17 per ton. Santo Domingo ore averaged \$17 per ton, and Santa Rosalia \$13 per ton. Mr. Levy has worked large quantities of these ores in arrastres at Santo Domingo.

III.—ARGENTIFEROUS LEAD AND SILVER MINES.

Under this caption I include the claims and mines producing galena ores or carbonates—ores of lead, and ores of lead containing silver, as well as the mines producing the silver ores proper. Considering the fact that some of the more important mines produce gold as well as silver, the two metals being united in the ore, it is difficult to decide under which caption to place the descriptions. This is especially the case with such properties as the Commonwealth and the new discovery at Fresnal, where free gold accompanies silver ore, as in the Comstock lode in Nevada. There can not be any question about the Silver King of Arizona, one of the very few mines which yield silver without gold.

SILVER KING.

In 1896 there was a revival of mining at this celebrated property, which is reputed to have produced several millions of ounces of silver, and to have paid out over \$2,000,000 in dividends. But the renewed prosperity of 1896 was not of long duration. The production has declined. It is more than probable that the ore body, which is so suddenly and sharply cut off at the seventh level, is a slide or mass broken from the main body or chimney of ore further up the hill, but now deeply covered from view by the rock accompanying the ore which has been moved. The extent of the slide or faulted ground is not known, and can be ascertained only by the most patient, thorough, and skillful geological investigation. That there has been such a slide, and that somewhere in the mountain the downward prolongation of the Silver King ore ground exists, I have no doubt. The direction of the movement should have been most carefully noted on the rocky floor of the 700-foot level, where the richest body of silver ore found in the property rested upon a barren rock floor, below which costly borings with the diamond drill from the adjoining shaft failed to find any trace of the Silver King lode. It seems probable that this problem will be left to the next generation to solve.

SILVER OF GLOBE DISTRICT.

The limestone which forms the hanging wall for the veins of copper is some 7,000 feet thick and is the foot wall of many of the old worked-out silver mines—such as the Alive, Miami, Centralia, Dime, and several others—all of which have produced from \$30,000 to \$200,000 in silver.

The silver country proper, however, is situated some 13 miles from the town of Globe. Here we find the old workings of the McMorris, Stonewall Jackson, Rescue, Old Mexican, etc., which in early days proved bonanzas to their owners.

The country is essentially a limestone country, the silver being found in pockets, usually small, but wonderfully rich. These pockets are mostly found under quartzite caps carrying red hematite.

The silver is found as chloride mixed with huge masses of native silver, and has carbonates, some embolite, and vanadinite mixed with it. The whole mass is usually associated with hematite, and is invariably free from gold.

The history of these mines shows that they contained from three to seven of these pockets. In one case—that of the Old Mexican mine—only one pocket was found; this, however, netted the owners \$168,000 in value of silver. In the report for 1896 and 1897, also, a photogravure showed the form of one of the silver nuggets found 12 miles north of Globe in August, 1895, which weighed 31 pounds and was 0.900 fine.

TOMBSTONE.

Most of the mines at Tombstone are now idle, and the town is almost deserted. It is interesting to note that ore has been traced from the old claims of the Toughunt and Goodenough through the Way Up down into the Empire claim, and that at present the most promising field for prospecting and working lies in the region beyond the Empire, where in fact some ore is being taken out. A rich strike was reported in the Wedge.

The older and larger mines at Tombstone, such as the Contention, the Grand Central, and Way Up, which have yielded so generously in the past of gold and silver, are not now worked for account of the companies owning them, but there has been considerable chloriding in a small way. The dumps also have been partially worked over by the cyanide process. A large portion of the semi-decomposed porphyry thrown out from the Contention mine carried free gold in it, flakes spread in little specks and patches upon the cleavage joints and surfaces. Some of this porphyry in the upper levels was also more or less coated and impregnated by chloride of silver, occasionally in distinct but small cubical crystals. Such rock, if not too clayey and impervious for free leaching, should yield good results by the cyanide process.

The great drawback to the working of these Tombstone mines in depth is the great influx of water and the cost of lowering it by pumping. The connection of the deposits or veins under ground is such that one claim can not be drained without draining the others. It therefore becomes essential to have a union of the interests of the various owners and a pro rata agreement to bear the cost of pumping from a central station.

SILVER HILL MINING DISTRICT.

The Liberty mine, worked by William Clark, has been a steady producer of argentiferous lead ore of high grade, and Mr. Clark has made regular shipments to the smelter. The ore is carefully sorted out to a high grade by hand. It often runs from \$400 to \$600 per ton.

Dr. Purcell has a mine named the "Wind Up" in the same district, about a mile from "Liberty Clark's" mine, which is being developed.

VEKOL.

This famous mine, which has yielded quantities of very rich silver ore, has been reopened. In February, 1898, there were about 25 men at work upon it, under the direction of P. B. McCabe. Fine specimens of ore from this property were sent to the Chicago Exposition and are now in the Museum of the University.

EMPIRE SMELTING COMPANY, CRITTENDEN.

Under the general management of Dr. Eames, of New York, extensive preparations were made for opening mines and smelting silver lead ores at this camp. It was understood that one or two 100 ton furnaces would be required to meet the capacity of the mines. In September, 1897, Mr. Richard Eames, jr., the superintendent of the Columbia Smelting Company, was in Tucson and reported that the smelting furnace, after a temporary closing down, was again in successful operation, and was turning out three carloads of silver-lead bullion per week. They were working on ore from the Hardshell. The condition of the road was such as to render it difficult to get sufficient ore to the furnace to keep it running. Since then no reports have been received.

GALENA IN THE SIERRITAS.

There are several localities from which a galena of low grade in silver can be obtained in the Sierritas, south of Tucson. A sample from one claim about 35 miles south of the city yielded 42 ounces of silver by assay.

OLD YUMA MINE.

This claim in the Tucson Mountains, about 9 miles from Tucson, was formerly worked extensively and yielded large quantities of lead ore. It is now lying idle.

Assays of masses of galena left upon the dump show that it is poor in silver. From the abundance of wulferrite and the large size of the crystals it is fair to conclude that molybdenum is abundant in the galenite. The claims are easily accessible, and hauling ore to water at the Santa Cruz would not be expensive.

THE QUIJOTOAS.

The mines of the Quijotoa Mountains, which attracted so much attention years ago, and upon which millions of dollars were expended without adequate returns, are now idle and are practically abandoned. The massive and costly machinery at the mines and mill, and the pumping plant in the valley, have long been for sale at very low figures. The whole appears to be a monument to ill-advised and misdirected energy.

SILVER BELT MINE.

Yavapai County, in the valley of the Agua Fria, 19 miles from Prescott, at an elevation of about 4,800 feet above tide. The vein crops on the eastern slope of open rolling hills. Slate formation, trending N. 30° E., dip to west about 70 degrees. Vein trends same as slates. One to 4 feet thick. The ore consists of galenite, blende, and silver sulphide or argentiferous gray copper. The gangue is siderite (iron spar), manganiferous, and heavy. There is not much quartz. Barite is present in considerable amount, and is closely associated with the galenite. This barite being very heavy renders the concentration of the ore more difficult than if quartz alone formed the gangue. In the lower level the white, soft talcose slate is seamed with sheets and thin layers of small crystals of galenite and blende. Considerable ore was formerly taken out and shipped from this claim and from the adjoining claim called the "Cabinet." The main shaft, an incline, in the year 1886 (since which little has been done) was 255 feet deep. The main level at depth of 150 feet was about 1,300 feet long. The mine up to that date had produced over \$300,000 in value of silver. At the old prices of lead and silver the ore was worth about \$125 to \$130 per ton. Since the great fall in the price of silver there has not been much inducement to work this mine.

TIGER MINE.

Located in the heart of the Bradshaw Mountains, upon an unusually well-defined and large vein, which crops out boldly and bears silver ore. In thickness it varies from 2 to 8 feet, but most of the croppings show a thickness of about 3 feet of iron-stained, honeycombed quartz, from which the pyrites have been leached out by the weather. Galena and blende are the principal associated minerals with the silver ore proper—tetrapedrite. Native silver in wires and filaments has been taken from this mine. The vein is near to the plane of contact of the granite, in which it lies, with the ancient slates or mechanically formed rocks characterizing the mountains along Humburg Creek. The granite walls have suffered much decomposition along the vein. A three-compartment shaft was projected and was sunk vertically in the firm gray granite at a distance from the vein to a depth of 300 feet, at a cost of \$50 per foot, with the intention of cutting the lode at a depth of 800 feet. Since the destruction of the value of silver there has not been much inducement to work this mine.

PECK MINE.

The Peck mine, in the Bradshaw Mountains, has been a large producer of silver, and is credited with a yield of at least a million of ounces. This is another of the many mines in the Bradshaws which have suffered or have been practically closed since silver fell so greatly in value.

The Del Pasco is another mine in the same district which was formerly worked to advantage, but which has been idle for many years.

DASON'S.

Location, Yavapai County, south of Prescott. Produces silver ore. A well-defined vein, with regular walls and vein stone. The vein stuff consists of quartz and iron spar, arranged in regular combs or layers, with crystals pointing inward upon the central layer of galenite and brittle silver ore. Native silver has been found in lumps in the gangue. This mine is opened by tunnels and is credited with the production of over \$700,000 in value of silver up to the year 1887.

AMERICAN FLAG GROUP.

The American Flag group of mines was operated in 1881 by Col. J. M. Haskell and Prof. E. H. Cook, of Tucson. These mines are in Old Hat district, in Pinal County,

a few miles west of Oracle, and on the northeastern flank of the Santa Catalinas, and some 40 miles from Tucson by the road. The district was organized about the year 1878. The principal locations in 1881 were known as the American Flag, Pioneer, Wedge, Good Luck, Black Bar, Bullion, and Commonwealth. There were, also, the Oracle, Mermaid, Summit, and Hoodoo, the four last mentioned being 3½ to 4 miles distant from the first by the new road.

The American Flag claim was opened to a depth of 178 feet, with a drift at a depth of 70 feet of 36 feet to the east and of 90 feet to the west, as shown in the small longitudinal section. The course of this vein is N. 40° W., dip easterly about 40 degrees. It is a thin vein in hard syenitic and granitic rock. It averages 6 to 8 inches in the lower part of the shaft, at and below the water level. At the surface south and east of the shaft the croppings are heavier, being from 2 to 3 feet in some places. In the east drifts the thickness ranges from 3 to 20 inches, and along the west drift it pinches down to a few inches only. The ore carries both gold and silver, but is generally low grade.

At the claim known as the "Bullion" a shaft 102 feet shows a vein of quartz from 3 to 15 inches in thickness and containing some good ore. It has been drifted on 60 feet northwest and 56 feet to the southeast. The dump is 5 feet deep. The Black Bar is supposed to be the prolongation of the Bullion vein. It is a similar vein, but is more broken up.

The Commonwealth is a quartz vein in granite, and is gold bearing. It was opened by a shaft 44 feet deep, following the pitch of the lode. This claim is about a mile from the others toward the mountain. The vein varies from 18 to 24 inches in thickness and carries a sprinkling of galena.

The Good Luck is on another small quartz vein traversing granite and resembles the quartz of the American Flag.

The Pioneer is on the line of prolongation of the American Flag, and has similar ore. Its direction is N. 50° W.; its dip easterly at an angle of about 45 degrees. The incline is 80 feet deep; width about 12 inches. The Wedge claim was located between the Pioneer and the American Flag. At the Oracle claim there was an incline shaft about 40 feet deep to drifts, one being 54 feet long and the other 18 feet. The vein in places has a thickness of 3 to 4 feet of good-looking ore. The Mermaid-claim has a 6-foot outcrop of hard quartz.

The Summit claim shows some good ore in a vein of quartz some 6 to 8 inches thick. A shaft 70 feet deep shows an easterly dip to the vein. It is claimed that some of this ore showed by assay a value of \$80 per ton. The croppings show well at the crossing of the old road. The Hoodoo claim is upon a small 6 or 12 inch quartz vein in granite.

LEAD ORE IN THE CATALINAS.

Lead ore occurs in another portion of the Catalina range and has been exploited for several years by Mr. Samuel Ramsdell. It was reported in February, 1898, that he had sold the property to Mr. H. C. Young, of Boston, who would proceed to develop it and to ship ore.

MINERAL HILL.

Many of the mining locations and the veins of this district were visited and examined by me in December, 1881, and the following notes upon the region were made at that time: The locality is about 15 miles west of Florence. The post-office was known as "The Cottonwoods," in Pinal County, and was about 12 miles from Picket Post. Some 500 or 600 mineral locations were reported as recorded in Florence. The oldest claim had then been occupied about four years. The ledges are large and numerous and are upon the west side or slope of Mineral Hill Mountain. There are several springs, affording excellent water, and they do not dry up. A well 30 feet deep has 10 feet of water in it. There are five or more springs within a circuit of 3 miles. I was hospitably entertained at the home of Mr. C. D. Henry and his wife, from Vermont.

The Alice is probably the principal vein. It is a boldly cropping lode, standing up 15 to 20 feet or more in places above the wall rocks and is from 8 to 15 feet thick. It is only one-quarter of a mile from the springs at the Cottonwoods, and is easily accessible. This lode cuts a mica-slate formation in a northwest and south-east direction. It forms a sharp crest to the hill, being of quartz and harder than the slates. It dips easterly at an angle of from 65 to 70 degrees. This vein is very well formed. It has a clay gouge or selvage on the foot wall, and this selvage contains rounded masses of hard stone. The veinstone is lamellar, consisting of layers of quartz and calcite, some of it being black or dark colored and bearing horn silver. It is a silver-bearing lode. It carries argentiferous galena, which by oxidation leaves lead carbonates and oxides and the chloride of silver. Toward the north end the lode splits up into several branches, and about midway of the long line of croppings the lode is cut away by a transverse gully or arroyo, thus making two parts or

lines of cropping, the southernmost trending N. 45° W. and the northernmost part trending N. 65° W. (magnetic). And near the southern end of the croppings there is a short twist or turn of the walls to the west and beyond this a strong outcrop of black calcareous spar. A shaft sunk here 66 feet reaches and passes the level of a tunnel below. The vein where intersected by this tunnel is from 8 feet to 10 feet thick.

In a winze 34 feet deep near the black spar a streak or layer of fine-grained lead ore ("steel galena") was exposed, but this ore is poor in silver, running only 7 or 8 ounces to the ton of ore.

Silver ore is found at intervals in the north croppings in the form of silver chloride. The gangue is friable. In places the silver ore is formed in small shot-like globular masses or grains, coated over with a layer of red iron oxide, forming a crust inclosing the cerargyrite. Evidences of the occurrence of embolite and bromyrite were also noted, but were not verified by examination.

Shipments of ore from the Alice vein were made to the Castle Dome Mining and Smelting Company, at Melrose, opposite San Francisco, with the following results:

	Ship- ments.	Silver.	Lead.
	Pounds.	Ounces.	Per cent.
Average.....	14,564	37.2	18.0
North croppings.....	894	163.8	3.5
Do.....	198	80.3	3.0

About a mile south of the Seven Cottonwoods and the Alice, another claim has been located, called the Tully.

The Tully or Carbonate.—This is supposed to be upon the main lode of the Alice in its southward extension. The croppings are bold and in layers of quartz and calcite, like those of the Alice. A medial layer or seam of fluor spar occurs here, and the vein carries galena and lead carbonate derived from the decay of the galena. Silver chloride does not show in the croppings as freely as at the Alice, but there is more lead ore.

Proceeding southerly toward the Gila River, over hills of mica slate, we pass the Leroy claim.

Leroy claim.—A hard vein of quartz about 6 inches thick in granite. It may be described as a gash vein of no great extent, but it has considerable ore mixed in with the quartz, and is said to have yielded at the rate of \$85 in value per ton to Mr. Mosheimer from the croppings.

The mica-slate country from this point toward the Gila River changes to granite and there are several outcrops of copper ore, amongst them a location called the San Carlos, for a description of which see under the head of "Copper."

Wedge claim.—This claim, on a lode of argentiferous lead ore, is in the Cholla group of claims, about 5 miles north of the Alice mine. It occurs in the mica slate group of rocks, which are much plicated and are filled with quartz, generally in barren veins. It is some like the Alice vein and is made up of alternate layers of quartz and calc spar, much of this spar being black or brown in color from the presence of manganese and iron. Much of the quartz is crystalline and some is amethystine. There are many open spaces or "vugs" and pseudomorphic impressions or casts of the dog-tooth form of calc spar are common. There is also much rusty iron oxide and ore near the hanging wall of the vein, where the quartz is formed in successive sheets and layers and carries considerable lead ore in the form of galena and carbonate over a breadth or thickness of 16 to 18 inches. This was observed in the incline shaft at a depth of about 50 feet.

Considerable galena ore has been extracted. A sample of 185 pounds yielded by assay at the rate of 66.3 ounces of silver per ton of ore and 51.5 per cent of lead.

The fluor spar occurs here in small cubical crystals with truncated edges—the dodecahedral planes. Some of the quartz crystals are brown and smoky. The ledge is very large. It trends N. 32° W. and dips west at an angle of 45 to 50 degrees.

DUNN MINE.

The Dunn mine, in the Chiricahua Mountains, was worked in the year 1881 by Chiricahua capital. It is located on the summit, or near it, at the head of Pinery Creek, about 40 miles east of south of Wilcox, on the Southern Pacific Railroad, in Cochise County. Mr. E. N. Titcomb was sent out in charge of the property. He erected a smelter a mile west of the mine for smelting the ore from this mine and from other claims in the region. This smelter was taken down some years after and was set up near Tucson. The mine and others near it have of late been shipping ore to the smelters

at El Paso by way of Willcox. The ore is an argentiferous lead and occurs in limestone near dikes of porphyry and layers of slate.

GREAT AMERICAN MINE, SWISSELHELMS.

The elevations known as the Swisshelms form a spur from the Chiricahua Mountains, projecting westward into Sulphur Spring Valley. They are nearly west from Tombstone. The creek known as White River turns the northern end of this spur and then runs southward into Mexico. The mine is near the northern end of these mountains, a few miles south of Powers's rancho, on White Creek, and consists of a great outburst of quartz ramifying in many directions through limestone strata of Carboniferous age, and not far from the contact of the beds with plutonic rocks. There are many open cuts, tunnels, and shafts. A large amount of silver ore has been shipped away to the smelter, but at present the mine is not worked. It has been tested in depth by diamond drills, as shown by the parts of cores left on the ground.

IV.—COPPER.

PRODUCTION OF COPPER IN ARIZONA.

The fame of Arizona as a copper producer extends throughout the world. The ores of this most important metal in their varied forms are extensively distributed throughout the Territory. The chief and best-known centers of production are Bisbee, in the southern portion of Cochise County; Jerome, in Yavapai County; Morenci and Clifton, in Graham County, and Globe, in Pinal County. Large quantities have also been produced in Pima County, near Tucson, and in the Santa Ritas, near Rosemont. In the early days of the Territory, even before the construction of the railways, quantities of copper were produced at the Longfellow mines and sent out by ox teams overland. In those early days, also, the mines of the Ajo Mountains produced and shipped large amounts of native copper and the scarcely less rich and valuable red oxide to San Francisco by way of Yuma and the Gulf.

It would be a great and almost impossible task to enumerate, and much more difficult to describe, all the localities of copper ores in Arizona. Many of great promise are yet lying idle, waiting for the hand of capital to develop them. Many are yet to be discovered, for the work of the prospector in Arizona is not yet completed.

The year 1898 has been a busy and profitable one generally for our chief copper producers. The production has not only been well sustained, but it has exceeded the records of former years. Great advancements and improvements in the art of reducing the ores have been made, by which not only the cost of treatment has been reduced, but by which ores of a lower percentage can be profitably treated, while at the same time a superior product can be turned out, costing less for transportation. The well-known Williams Brothers at Bisbee and the managers at Jerome and at Clifton have in their respective fields been in the vanguard of progress and have not allowed the reputation of Arizona for alert progressive intelligence to suffer or to be diminished.

*Production of copper in Arizona.**

	Pounds.		Pounds.
1883.....	23, 874, 963	1892.....	38, 436, 079
1884.....	26, 734, 345	1893.....	43, 902, 824
1885.....	22, 706, 366	1894.....	44, 531, 108
1886.....	15, 657, 035	1895.....	48, 329, 405
1887.....	17, 720, 462	1896.....	73, 745, 321
1888.....	31, 797, 300	1897.....	81, 019, 922
1889.....	31, 586, 185	1898 (six months ending June	
1890.....	34, 796, 689	30).....	49, 503, 294
1891.....	39, 873, 279		

The total copper production of the United States for the first six months of the year 1898, ending June 30, amounted to 269,880,880 pounds of fine copper.†

While there is a considerable export from Bisbee of copper in the form of rich copper matte through Nogales into Sonora, Mexico, there is also a large importation of the metal through the same channel. In the month of March the importations at Nogales were the largest in the history of the custom-house, amounting to 7,635,874 pounds, valued at \$551,984.

* The figures from the year 1893 onward are from the tables given in the *Mineral Industry*, Vol. VI, Sci. Pub. Co., N. Y.

† Eng. and Min. Journal, July 16, 1898.

The product of the French company's mines at Boleo, Lower California, opposite Guaymas, which was formerly sent out by water around the Horn to France, is now transported by rail from Guaymas overland by the Southern Pacific Railroad to New Orleans and thence by vessels. The Boleo produced in 1897 over 11,000 tons of fine copper, or nearly 1,000 tons a month.

BISBEE.

The production of high-grade, 99 per cent black copper at Bisbee has been during 1898 the largest in its history. It is said to average two carloads a day. Besides shipping ingots of black copper, there is a considerable output of a rich copper matte, which is sent to Mexico to supply another company with a desirable form of flux. It contains about 45 per cent of copper, and is sent at the rate of about a carload a day to Agua Caliente, Sonora, Mexico, by way of Nogales.

In 1896 the company was running four blast furnaces and smelting about 400 tons daily in each twenty-four hours. The product was copper matte, which was bessemerized or treated by the pneumatic method in two stands of trough converters, giving a product of ingot copper averaging 99.3 per cent of fine copper. The production for the fiscal year ending June 30, 1896, was 10,492,418 tons, or 20,984,510 pounds of bessemer pig copper, averaging 99.2 per cent fine copper.

The introduction of the pneumatic process, with its special American modifications and improvements, at Bisbee and at Jerome has revolutionized the art of copper smelting, and has made our text-books upon the subject valuable chiefly as histories of the metallurgy of copper.

THE MASONIC CAVE AT BISBEE.

In November, 1897, the great Copper Queen mine had the honor of receiving within its depths, 900 feet under ground, in the magnificent cave, a notable assemblage of the grand lodge of Masons of Arizona. Not having had the privilege of being present, and as the beautiful cave no longer exists, having fallen in this spring, I quote a description from the columns of the Arizona Daily Citizen:

"It was generally understood that extensive preparations were in progress for their reception, and that among other sights to be seen in the great copper camp was a cave about 900 feet under ground. The camp itself is a marvel of human ingenuity. Confined to limited surface area, every inch of space is utilized, and much of the works, even as it is, stand on 'made ground.' The plant, though said to be not large, is a marvel of perfection and human ingenuity. Its fame over the country has gone far and wide. To see this, and at the same time attend the grand lodge, was an opportunity that rarely came and could not be overlooked. There are in Arizona fourteen Masonic lodges, situated in the towns of Tucson, Phoenix, Nogales, Bisbee, Tombstone, Clifton, Globe, Jerome, Prescott, Florence, Winslow, Flagstaff, and Willcox, with a membership of probably 1,000, made up of 'the best the country affords.'

"Every lodge, no matter how remotely situated, had its representatives present. Tucson sent 17, Phoenix 15, Prescott 6, Nogales 6, Globe 4, Clifton 4, Willcox 5 or 6, and so on through the entire list. A special train was sent from Bisbee to meet the visiting delegations at Benson, where they were also met by a committee from Perfect Ashlar Lodge, of Bisbee, who presented the visiting brethren with souvenir badges and escorted them to their hospitable town.

"Bisbee is fortunate in more than one respect. It is situated near the head of a canyon on almost the extreme south edge of Cochise County, about 6 miles from the Mexican line. It is owned by the Copper Queen Company, and is generally understood to be one of the many copper camps controlled by Phelps, Dodge & Co., of New York. It is reached by its own railroad, which connects with the Southern Pacific at Benson, about 35 or 40 miles northwest. It is said that there are 1,000 men on the pay roll of the company. The wages paid are \$3 above and \$3.50 below ground, and fortunate indeed is the man whose name is on the roll of the favored thousand. The output of the camp is said to be three carloads of refined copper per day. The town is scattered up and down the canyon for at least a mile, but the town proper is centered immediately east and south of the big smelting plant. The business of the town is carried on largely in the canyon, where the stores, saloons, restaurants, and lodging houses are principally located. On the steep face of the mountain south of the canyon is to be found the principal residence portion. The main canyon is intersected by another a short distance below and almost immediately opposite the smelters, and is known as Brewery Gulch. As this gulch afforded a limited quantity of building space, it has been made use of, and here the small merchandising of the community is carried on. On the whole it may be summed up that the mines and

reduction works of the company occupy the north side of the canyon, the residences the south side, and the business houses the canyon proper.

"At the head and front of the Copper Queen Company stand two men whose names are household words in southern Arizona, Messrs. Ben and Lewis Williams. The former is superintendent, and under his direction the Copper Queen Company's plant and mines at Bisbee have passed into history as one of the most successful copper-producing works in the country. Independent of the great value of the mines, there are not less than a million or a million and a half dollars involved in the great plant itself and incident thereto. Mr. Lewis Williams, or, as he is better known among the little army of employees, 'Don Lewis,' is second in command, and in the absence of Mr. Ben Williams is superintendent in charge; but at all times the smelting plant is under his immediate supervision. Than these gentlemen there are not two more popular employers of labor in the whole country. Their fair and courteous treatment of the men and the kindly interest in the welfare of their employees have endeared them to all.

"The library building is a large and commodious structure of brick and stone. On the first floor is the library proper and post-office. The building is lighted by electricity, is well supplied with tables and chairs for the free use of all comers, and books, magazines, and papers from all over the country. On the second floor is the town hall, carpeted, comfortably and substantially furnished. In this hall Union services are held each Sunday and upon special occasions by the Rev. J. G. Pritchard, a broad-minded, God-fearing man. The fraternal orders of the United Workmen, Odd Fellows, Knights of Pythias, and other kindred organizations make use of the hall for lodge purposes. The Masons also formerly met here, but now, thanks to the generosity of the Copper Queen Company, manifested through the kind offices of the Messrs. Williams, they have one of the very handsomest lodge rooms in the Territory. On a spur of land at the intersection of Brewery Gulch with the main canyon a building site has been blasted out, and a large, fine, substantial edifice of brick and stone erected thereon. Like the library building, it is a two-story structure. The lower story will be occupied by the offices of the company; the upper as a Masonic hall, to the exclusion of all other orders. Like all Masonic lodges, it is built due east and west, and is not only substantially but elegantly furnished in all the paraphernalia of the order. The lodge room proper, independent of two commodious anterooms, is 40 by 65 feet; the wainscoting is oak finish, the walls white, and the ceiling blue. The beading on the wall against the ceiling is red and blue. In the west, behind the senior warden, but raised sufficiently high to command a view of the lodge, is a recess in which is placed a piano. The furniture, including desks, altars, etc., is of massive oak. The seats are cushioned in dark leather and the floor is covered by a carpet in which are wrought all the emblems of Masonry. Taken all together, Perfect Ashlar Lodge No. 12, F. & A. M., has one of the finest and most elegantly appointed lodges in the Territory.

"Wednesday morning, at 9 o'clock, pursuant to adjournment, Grand Master Nichols called the lodge to order preparatory to taking up the line of march to 'the cave.' Clothed in white gloves and aprons, the 200 men in line made an imposing appearance as they marched from the lodge to the hoisting works, from which they were to descend into the mine and cave. In the line of march the grand lodge was in the rear, but on reaching the works the column halted, opened ranks, and the grand lodge passed through, and was, of course, the first to enter the mine. They were scientifically stood on the cage, a half dozen at a time, when down they went, about 200 feet in a second, to the level by which the cave was reached. The distance to the cave was substantially a half mile, and candles had been placed a few feet apart in the drifts the entire distance. The cave lies in a northeasterly direction from where the mine is entered, and is said to be about 900 feet under the surface of the hill in which it is situated. It is probably nothing more than a great bubble in the limestone formation. So far as can be judged by observation, it is probably 250 by 300 feet in extent and 65 feet deep in the center, although much of the depth has evidently been lost by the fall of stalactites, some of them weighing tons, and which because of their great weight had broken from the roof; others looked as though they needed but little encouragement to do the same thing. The west end had been partially filled and a platform capable of seating about 300 people erected thereon, and the whole brilliantly illuminated by scores of incandescent lights. In the letter 'G,' suspended in the east, no fewer than thirty-two electric bulbs had been placed. On the platform and extending into the cave the electric wires had been shaped into a square and compass. The extended points of the compass were 100 feet apart and the shaft of the square 120 feet to the angle. In the formation of this mammoth emblem of Masonry 56 electric lights were used, and numerous other lamps were placed elsewhere about the cave. An idea of the magnitude of this work may be gathered in the fact that $3\frac{1}{2}$ miles of wire were used in it. Before calling the lodge to order an opportunity was given those present to view the enchanted spot, where, far beyond the approach of cowans and eavesdroppers and amidst the magnificent

splendors of nature's handiwork, Masons met on the level and parted on the square. "Stalactites, from the size of a drop of water to that of the giant tusks of some antediluvian monster, hang suspended from the roof, and beneath the white glare of the electric light they danced and shimmered like icicles in the sun. The growth of these stalactites is known to be almost incomprehensibly slow, and the increase in a thousand years may be lost to the sight; but they take no heed to the weight of time. For perhaps thousands of ages the cave was but a black and tenantless hole, wrapped within the mighty ribs of a great mountain which was, centuries ago, thrice or even ten times its present size. And all this time the slow oozing of its vaporous breath, like frost on glass, had transfigured the black, unsightly walls. Singly and in clusters, some in blue and some in white, of all lengths and shapes, these stalactites cover the roof, while among them in labyrinthine irregularity glitters the crystal ooze."

"On the north side, almost opposite to where the cave was first broken into, the lime god has created the fairest creatures of his handiwork, and what King Solomon wrought in years was here fashioned in a single night, but a night that knew no day nor the sound of ax, hammer, or any tool of iron till the operative workman, agreeably to the designs drawn upon the trestle board, revealed its hidden treasures. Here are the steps, the pot of incense, the beehive, the hourglass, and waterfall. The steps, whiter than Parian marble, lead upward and into an unexplored beyond; the beehives, apparently made from great coils of alabaster rope, are from 2 to 10 feet in diameter and 6 feet high. East of these is the waterfall, stayed midway in its descent by some hypnotic hand; white and awe-inspiring in its silent grandeur is this seemingly stilled torrent of foaming waters that ere it slept had dashed its spray on hummocks of ice and in a thousand fantastic shapes sparkled in the light. There are curtains and veils behind which no man may enter, woven white and transparent in the Cimmerian darkness. The whole aspect of the cave is one of entrancing and bewildering loveliness, and he who can gaze without awe upon the grand scene has no sense of beauty in his soul."

UNITED VERDE COPPER MINES.

This well-known group of copper and gold producing properties at Jerome, Yavapai County, has been in active operation through the year. According to an interview with Mr. W. A. Clark, the owner, at the end of the year 1896 the property was producing about 40 tons, or 80,000 pounds, of copper a day. The ore is smelted at the mines, producing black copper, almost pure, or 99½ per cent fine. It is sent East for the extraction of the precious metals by the electrolytic method. This gives pure commercial copper, and the gold and silver are recovered from the tanks.

Great improvements in the plant and buildings have been made, particularly such as were needed to diminish the risk from fire. Five large steel buildings have been put up, including an engine room, converter, blast furnace, machine shop, foundry, boiler room, and blacksmith shop.

The development of the mine is kept well in advance of the extraction of ore, so as to maintain ample reserves of ore to draw upon. About 600 men are employed in and about the mine and the smelters. No report of production has been received from this property. A visitor to the camp in April, 1897, supplied the following description to the Jerome Mining News:

"The mines and reduction works of the United Verde Copper Company at Jerome are at present employing over 500 men and handling approximately 400 tons of ore a day. The principal shaft is about 500 feet deep and from different levels tunnels have been driven, and the underground workings are extensive. The engine capacity of the plant amounts to 2,000 horsepower, which is utilized in hoisting ore, operating air drills, copper converters, machine shops, and a 40-ton crane. A vast amount of new iron work is being put in, consisting of structural works for buildings covering the entire plant, consisting of engine and boiler rooms, converters, blast furnaces, machine shops, and foundry. Additional engines and boilers and two new converters are being put in. A new reverberatory furnace has just been completed which will be used in smelting the finer ores, especially those rich in silver. The ore when taken from the mines is first roasted in heaps, extending along the slope of the mountain in three long rows, whereby it is desulphurized. It then goes to the blast furnaces and finally to the converters. The copper bullion which is thus produced is about 99 per cent pure copper. The mines, smelting plant, and town of Jerome are situated on the east slope of the Black Hills range, pretty well up toward the crest, at an altitude of about 5,600 feet above the sea level and at least 1,800 feet above the Rio Verde Valley, which spreads out in grand panorama to the east and south. The town contains about 3,000 people, and while a considerable amount of prospecting is going on in the adjacent territory, there is practically no mining in progress except that being carried on by the United Verde Company. The latter has a water system of some magnitude, the supply being derived from mountain springs. The United

Verde and Pacific Railroad, which runs from Jerome Junction to Jerome, a distance of 26 miles, is an example of interesting engineering. Fourteen miles of the road—that portion which traverses the Black Hills range—contains 188 curves, 34 of which are of 40 degrees, 2 of 45 degrees, and 132 from 36 to 40 degrees. In this distance of 14 miles there are but two places where a train of five or six cars can straighten out."

The company early in the year 1898 had seven 250-ton furnaces of rectangular section, three of which are run at one time. These are fed with roasted ore, which is said to average 15 per cent copper. The roasting is effected in heaps and requires about one month of time. The larger part of the sulphur is expelled by this roasting. Very little flux is required. The water jackets of these smelting furnaces are made of sheet steel. These jackets are put together at the works on the spot, for which all facilities are provided. The molten product of the furnaces is drawn into large pots and is taken at once by means of an electric crane to the Bessemer converters, where, by the pneumatic method, the charge is purified by the oxidation of the impurities, producing black copper, 99 per cent pure. Large kettles, holding 8,000 pounds, are provided for the slag and are run out upon rails.

The dust chambers are so arranged that the dust as it is collected is returned to the furnace automatically and enters the stack below the fuel line, thus avoiding the force of the blast which would tend to return it to the dust chamber again without its being acted upon.

This black copper is refined in the east at a cost of \$20 per ton. The gold and silver is taken out and is returned to the company. The contents in gold and silver are variable. Blocks of siliceous silver ore are used in lining the furnaces. As these blocks are cut away by the action of the charge the silver and gold contents are liberated and unite with the copper.

The following figures, showing something of the production of bullion and of matte for a short period in 1887, before the introduction of the pneumatic method, will be interesting:

Date.	Ore consumed.	Limestone used.	Coke used.	Bullion produced.	Matte produced.
1887.					
Aug. 1-7	642,200	95,540	113,366	9,464	104,363
Aug. 8-14	442,640	81,532	80,575	5,850	83,640
Total	1,084,840	177,072	193,941	15,314	188,003

Assay of matte bullion, etc.

Date.	Matte assay.	Bullion assay.	Refined copper.	Silver in bullion.	Gold in bullion.
1887.	<i>Per cent.</i>	<i>Per cent.</i>	<i>Pounds.</i>	<i>Ounces.</i>	<i>Ounces.</i>
Aug. 1	75.4	94.50	3,373	.....	.....
2	62.7	95.80	1,291	22.00	2.25
3	65.25	90.00	1,369	24.00	1.16
4	51.00	88.80	568	9.50	.58
5	52.00	88.90	828	.....	.....
6	51.78	89.40	705	.....	.....
7	56.65	90.10	568	.....	.....

The average of gold in the copper bullion per ton was stated as eight-tenths of an ounce, and of silver 34.9 ounces. The per cent of copper in the ore from August 1 to 7, as determined by furnace working, was 12.1, and from August 7 to 14 it was 10.7. The two days, August 12 and 13, were idle. The following are the results of assays of samples taken by myself August 14, 1887, from the points stated:

Assays of United Verde ores.

Place taken.	Copper.
	<i>Per cent.</i>
1. Snyder crosscut, black ore	11.1
2. Blue-black ore	15.05
3. Southeast crosscut, 2 inches	11.20
4. Southeast crosscut, ore body	21.90
5. Face of ore body, 10 feet	18.50
6. Chrome claim, face of drift	7.89
7. Eureka crosscut, average	21.90

The last sample (7) showed by assay the presence of one-fifth of an ounce of gold per ton, and 1.8 ounces of silver. Some parts of the ore are richer in gold than others. A vein of gold-bearing quartz appears to intersect the copper-bearing beds.

THE CLIFTON COPPER DISTRICT.

This district, the oldest of the great copper-producing camps of Arizona, was discovered about 1865, and has been worked almost continuously since. It is now connected by rail with the Southern Pacific Railway at Lordsburg. The prevailing rocks are granite, porphyry, and limestone, and the ore is found in large bodies, chiefly in the limestone; secondary deposits of cavernous shape and replacing the limestone. Rich bunches of carbonate, red oxide, and of native copper occur also in the midst of the abundant kaolin clay left by the alternation of the granite and porphyry by the passage of acid cupriferous solutions, derived, no doubt, as at Copper Basin and at the other localities, by the oxidation in situ of bunches and lenticular masses of copper sulphide originally present as a constituent of the crystalline rocks, either in lenticular bunches of the segregated type or diffused in the mass of the rock. This form of origin, pointed out by me in my paper on the ores of Copper Basin (Transactions American Institute of Mining Engineers, February, 1889.), appears to be general, though in some localities the parent source may be in a vein or veins accompanied by regular veinstones, and thus indicate a source of the ore far removed from the adjoining rocks.

ARIZONA COPPER COMPANY.

The following from the Tucson Daily Citizen well describes the worth and property of the Arizona Copper Company:

"There is probably no town in the Territory of Arizona to-day so peculiarly situated as is the town of Clifton. Up in a dark, deep canyon, whose perpendicular walls rise to a height of several hundred feet, lies the seat of one of the largest copper camps in the world.

"In width the canyon is about 200 feet, and the San Francisco River runs through its center. It is the dividing line between what might be very properly called the two towns. On the west bank are the company's store, works, offices, etc., while the residences of the employees and the business houses occupy the east bank. The Arizona Copper Company is the life-giving factor to the town of Clifton. Without it Clifton would not exist. This company has invested upward of \$3,000,000 in mines, railroads, reduction works, and appliances for making the ores return a revenue.

"The company employs more than 300 men, and distributes \$35,000 per month among its employees, as shown by the pay rolls.

"Four thousand tons of ore are crushed every thirty days, and the product from this enormous pile of ore is 500 tons of pure copper bullion.

"Here it is concentrated to 4 per cent, and is then subjected to a leaching process which leaves but 1½ per cent of copper in the refuse.

"The ores are transported from the mines to the works by means of a narrow-gauge railroad, the distance between the rails being 26 inches.

"The best of the claims at present, probably, is the Metcalf. Although it has been steadily worked for twelve years, there is still ore enough in sight to keep machinery in operation for an indefinite time. Ore is also worked from the Long-fellow, which has always been a noted producer. Recently a number of claims, which were hitherto looked upon as nonproducers, have been opened up and are surprisingly rich.

"The company is now paying dividends for the first time. The prosperity of this property is almost wholly due to the efforts of Superintendent Colquhoun. Through him all the improved methods of work and the modern machinery have been introduced. His good judgment and economical management of affairs at Clifton have entitled him to rank as one of the very best mining men in the southwest. He is absent at present, upon an extended visit to his old home in Scotland. During his absence Mr. J. H. Hopkins will have charge of the steering-gear of the company's affairs and will undoubtedly render satisfactory service, as his long experience in mining affairs has fitted him for successful work in any department."

A somewhat more succinct statement is given by Commissioner George H. Kelley in his report for 1897, substantially as follows:

"The present plant of the Arizona Copper Company consists of four smelting furnaces having a capacity of 400 tons a day; one sulphuric acid plant, capacity 8 tons per day; one siliceous ore concentrating plant, capacity 180 tons per day, and one sulphide ore concentrating plant, with a capacity of 150 tons per day. The output of this company five years ago was equal to about 6,000,000 pounds of copper per year. In 1895 it had almost doubled, amounting to 11,500,000 pounds, and in 1896 exceeded all of its previous records by producing 13,000,000 pounds. Over half the

output is from concentrating and leaching ores, and ores as low as 3 per cent in copper are treated at a profit. * * * The output of copper bullion in Graham county for 1897 was estimated at 25,000,000 pounds."

MORENCI-DETROIT COMPANY.

This copper-producing camp, the home of the Detroit Mining Company, is 7 miles from Clifton and 1,500 feet higher. This company has a fine plant for concentrating and smelting copper ores. The pneumatic process has been introduced and the output for 1897 was estimated at about 750,000 pounds monthly.

COPPER AT CLIFTON.

According to George H. Kelley, the editor of the Graham County Bulletin, in the month of April, 1897, the great copper industry at Clifton and Morenci is giving most gratifying results. Both the Arizona Copper Company and the Detroit Copper Company have added new machinery and new methods to meet the low price of copper until the output is now double what it was a year ago. Phelps, Dodge & Co., of New York, owners of the Copper Queen at Bisbee, and the United Globe Mines, at Globe, have recently purchased from William Church, the former owner, a majority of the stock in the Detroit Copper Company, and the management of the affairs now passes to them, which is considered a good omen for that camp. There are no better copper properties in Arizona than those in the vicinity of Clifton and Morenci.

SHANNON COPPER MINES.

An important group of copper claims north of the Detroit and other properties of the district have been under development by Mr. Shannon for several years. The following item shows that these properties may now receive greater attention and prominence:

"Hon. C. M. Shannon, ex-collector of internal revenue for Arizona and New Mexico, has located in Clifton and will devote his time to the development of his copper mine, which is reported to be one of the best in the country."

THE COPPER DEPOSITS OF COPPER BASIN, ARIZONA, AND THEIR ORIGIN.

[From the Transactions of the American Institute of Mining Engineers, New York meeting, February, 1889.]

Copper Basin, in Yavapai County, Ariz., about 10 miles southwest of Prescott, is well named. It is a depressed area and a region of cupriferous impregnation, the principal development covering an area of about 40 acres. The geologic conditions are simple. The foundation rock is a coarse-grained granite and gneiss, in which soda feldspar predominates. There are also dykes of porphyritic rock and a large quartz vein containing pyrites.

Superimposed on this crystalline foundation, we find heavy beds of mechanically formed rocks, conglomerates, breccias, and sandstones, in horizontal layers cropping along the bed of a creek, and apparently the remnants of a much more extended formation, now denuded and largely carried away by gradual atmospheric erosion.

The heavy beds of conglomerate are in many places much broken and tilted up, even standing on edge in large blocks, as if they had been lifted by some great convulsion; but the cause is much more simple, being merely the removal by gradual disintegration of the softened and decayed granitic rock below.

The materials of these sedimentary beds are chiefly fragments of granite, gneiss, and plutonic rocks loosely mingled. They are the chief repositories of the copper ore, which forms the cementing substance. This copper ore is the blue and the green carbonate, azurite, and malachite, and the ore is so generally spread through the mass of the beds that the blue and the green croppings can be seen at a great distance, particularly after or during a shower of rain, when the colors are extremely brilliant and beautiful.

The copper carbonate is not only a matrix and a cementing material for the fragment of rock, but it invests and covers these fragments so that only malachite and azurite are visible. The beds are from 3 to 10 feet or more in thickness, and although seemingly solid carbonate of copper, rarely contain over 12 or 15 per cent of that metal. Some portions of the conglomerates are much more highly charged with copper than others, and in places the beds are almost without copper. If a lump of the coarse sandstone charged with the copper ore is digested in acid, the carbonate of copper is rapidly dissolved out, and the mass falls asunder in loose grains of sand.

In the bed of the little dry "wash" there are many boulders, from a few inches in

diameter to one or two feet, which are completely covered with a crust of azurite. If there are cracks and cavities in the bowlders, the copper carbonate will be found inside or below the surface, but is mostly upon the surface as a thin covering.

These copper depositions are clearly the result of the gradual percolation of copper solutions passing through the porous sand rock, and the copper carbonate is a deposit of incrustation, not of replacement, for so far as the sandstones and the conglomerate have influenced the deposition, the action appears to have been mechanical rather than chemical. The surface, rather than the chemical composition of the strata, appears to have determined the deposition. Nor does it appear that the copper carbonate has replaced any calcareous or siliceous cement. The absence of a cementing material seems to have favored the infiltration and distribution of the cupriferous solution, which may have been gradually concentrated by evaporation on the surface of the coarse grains of rock. Assuming what is very probable, that the copper was carried in as a dilute sulphate, it would be thrown down as carbonate on meeting carbonate waters, or meeting water or moisture in the rocks more or less charged with carbonate of soda. Sulphate of soda would be formed and flow away, to be perhaps concentrated by evaporation at some distant point, and form beds of Thenardite, a mineral which is abundant in Arizona.

These deposits of copper carbonate, covering, as has been observed, about 40 acres, contain in the aggregate a very large amount of copper. The question of the source of such extensive depositions of copper at once arises.

The granite below the cupriferous beds, and throughout the copper area, is very much decomposed and softened, so that it may be cut with a pick or shovel. Considerable areas of granite surface are exposed, and are not covered by sandstone. There are numerous veinlets and thin seams of red oxide of copper, accompanied with malachite, and malachite also occurs disseminated in small nodular or concretionary masses, not much larger than kernels of corn, in the soft ferruginous clay resulting from the decay of the granite. These little button-like disks of malachite are so abundant that they could be washed out with profit if water could be carried upon the ground.

There are also considerable quantities of red oxide of copper in thin sheets, with malachite on each side. These are chiefly broken out from numerous small veinlets traversing the granite. The red oxide is in the middle, and the malachite on each side next to the granite walls, the small infiltrated sheets of ore being seldom more than an inch in thickness, and commonly not over half an inch thick. In some places fragments of such veinlets are very numerous, having been weathered out by the washing away of the softened granite, but no extensive or heavy deposits have been found to justify sinking or mining upon. Several drifts and tunnels have, however, been run into the face of the granite hill following some of the veinlets of copper ore, but the results have not been satisfactory.

Some of the small veins consist partially of quartz, this being the veinstone-impregnated with malachite. These appear to have originated since the softening of the granite, and are probably the result of its partial decomposition.

In one of the principal tunnels, which has passed through the decayed portion of the granite and penetrated the unchanged interior portions, sulphurets of iron and of copper are found in small bunches and seams irregularly distributed. The quantity is not large—not enough to justify mining—yet in the aggregate the amount of cupriferous sulphide is probably sufficient to be the source of the oxidized superficial ores. Further evidence of the very general impregnation of the granite with copper sulphide was found in the shaft sunk near the bed of the creek to obtain water. Yellow copper ore is found there in small but solid masses in the midst of the hard gray unchanged granite.

I do not attempt an explanation of the source or origin of the chalcopyrite in the granite. Any satisfactory explanation would have a wide application. There is no evident relation of the sulphides to the porphyry dikes, nor, so far as observed, is there any pyrites in these plutonic rocks. This is, however, a matter for investigation.*

All the observed phenomena point to the disseminated yellow copper ore as the source of the superficial copper deposits, and as the principal factor in the alteration of the granite. It would appear that the soluble sulphates of iron and copper, formed by the oxidation of the copper pyrites, and carried by endosmotic percolation through the substance of the rock, have acted upon the feldspars, promoting their decomposition with the separation of silica and the alkalis; the deposition of copper as oxide and carbonate, the formation of alums, and probably also of sulphate of soda, which flowing away, may have concentrated beyond. The formation of the extensive deposits of copper carbonates may also have been brought about by

*As an example of copper in eruptive rocks, Daubree cites the melaphyre of Norheim near Creutznach, which, according to M. Laspeyres, contains 0.00118 of its weight of copper. *Les Eaux Souterraines*, ii, p. 134.

carbonated surface waters, or water more or less impregnated, as is not uncommon in those dry regions, with carbonate of soda. That soluble silica is one of the products we know, from the fact that in a little trickling stream of water flowing from a spring in the decayed granite there was an abundant separation of gelatinous silica, colored green by copper. In this abundance of silica separated from the granite we find an explanation of the origin of many of the little veins of quartz carrying copper ore, and another fact in evidence of the origin of quartz veins generally.

Thus the granite becomes softened in place and "rotted" as deeply as surface waters and air can penetrate; the sulphides disappear; silica and the alkalis are removed, and a ferruginous claylike mass is left with disseminated accretions of copper carbonate and the formation of quartz veins.

An extended chemical investigation is necessary to determine all the conditions which exist, before the exact order of interchange of elements can be stated with confidence. These Copper Basin deposits of copper ore in sandstone and conglomerate are very different from those found in the Triassic shales of New Jersey and of Germany and other countries where the ore is disseminated in grains or patches, and in the mass of the rock. In the Copper Basin deposits the ore is spread continuously through the mass and invests the grains of rock, forming a coating. The ore does not in any case appear to have been deposited by reason of the presence of any organic remains, as, for example, the stems of plants such as are found in the sandstones of northern Texas, or in Russia. Murchison has described cupriferous grits, sandstones, and shale, developed at the Zavods of Yngofski and Matovilika, where the ores of copper, chiefly the green carbonate, are disseminated, and are in the form of cupriferous concretions generally around the carbonized stems of plants.* Not only Murchison, but Maynard, has described the deposition of copper on organic remains in the copper sandstone of the Urals.† These Arizona beds differ from the cupriferous Permian strata, not only in the form of the copper deposition, but in their much more modern and local nature.

The copper deposits of northern Texas are familiar examples of the deposition of copper ore on the remains of plants.

Wendt has mentioned the copper of Copper Basin as "carbonate ore which must be of secondary origin,"‡ but otherwise it has not been noticed in our Transactions.

He considers the red oxide of the Santa Rita copper mines of New Mexico as derived from the native copper by alteration.§

The explanation of the origin of the Copper Basin herein given will apply particularly to the conglomerate deposits accompanied by extensive kaolinization of the crystalline rocks.

This Copper Basin ore is not a "smelting ore." The bulk of its substance is not sufficiently fusible. Its origin by infiltration suggests the nature of the process by which the copper should be taken out. It is an ore especially well adapted to leaching. The absence of soluble minerals other than the copper carbonate is a great advantage, while the open granular condition of the rock permits the ready action of a solvent and of subsequent lixiviation.

The conditions at once suggested the following process, which is given in outline merely:

1. The solution of the copper carbonate by dilute sulphuric acid.
2. The extraction of the copper by electrolysis.

The conditions favoring this method are numerous, but the greatest is:

The abundance in the region of auriferous pyrites, the "rebellious sulphurets," for which the gold miners are seeking the cheapest and best method of working. The distance over which these sulphurets must now be transported entails a heavy expenditure. The establishment of sulphuric-acid works at Copper Basin would make a home market for the sulphurets, and while the sulphur is utilized for making acid the oxidized residues holding the gold could be chlorinated. Thus the sulphide ores on the one hand and the clean carbonates of copper on the other, although difficult to utilize separately, would by combination give us the precious metals and the copper in a marketable form at a comparatively low cost, and the problem of working both is solved.

The spent residue of iron oxide might also be utilized (provided there was rail transportation) at lead-smelting works.

There are several economies by such a process which will suggest themselves. No great supply of water is required.

The acid need not be concentrated; "chamber acid" would be strong enough.

It is possible, also, that no great quantity of acid would be needed, for when the bath is once formed, it is probable that the copper ore itself may be made the anode and yield its copper to the solution direct.

* Russia in Europe and the Urals, p. 144.

† Trans., ix, 33.

‡ Trans., xv, 74.

§ "Copper ores of the Southwest," Trans., xv, 27.

Pine wood for fuel is abundant on the adjoining mountains, and dynamos can be run very cheaply.

Our fellow-member, Prof. G. W. Maynard, some years ago, put up a plant in Siberia for the treatment of copper carbonate conglomerate ore by lixiviation with sulphuric acid, and has promised to contribute to the Transactions of the Institute an account of the plan and its results in practice.

ROSEMONT DISTRICT, PINA COUNTY.

Rosemont, a noted copper-mining center, is situated on the eastern side of the Santa Rita range of mountains lying to the southeast of Tucson and about 40 miles distant. It is in the oak-tree belt and about 4,000 feet above tide. Some of the numerous claims and locations were formerly worked temporarily by Mr. L. J. Rose, of California, and finally, in June, 1896, passed into the possession of the Lewishu Brothers, copper brokers, of New York City. Since that time exploratory work has been carried forward on two or three of the chief claims, notably the Chicago and the other claims on the western side of the range and near the Frijole camp, where John Weigle was a resident for many years. The sale included all the possessions in the district of the former Rosemont Mining and Smelting Company, and was inaugurated and completed through the efforts of the late Dr. Alex. Trippel, himself one of the best-known mining men of Arizona, and formerly superintendent of the Old Dominion Mining Company, and also the Buffalo Mining Company, both of Globe.

The geology of this region is very interesting, both from the scientific and purely practical point of view. It affords excellent examples of contact deposits, and of replacement of limestone by ores of copper. Rocks crop out in great variety, and nearly all have traces of copper showing here and there, besides the main deposits or lodes. A very general metallization by copper is thus shown. The contacts between the chief formations are the main repositories of copper ore. There are several such contacts in the cross section of the Santa Rita Mountains, for in passing from west to east we find limestone and granite with copper deposits, as at and near Frijole camp, then quartzite with copper impregnations, then limestone with copper at the contact, then a dike of porphyry succeeded by limestone, red quartzite or sandstones, and finally conglomerates and slates.

The ancient quartzites form the summit of the range and these quartzites rest upon coarse porphyritic granite. The quartzite is believed to be Cambrian in age, the overlying limestone Silurian, and the conglomerates and shales Carboniferous.

Porphyry dike cutting through the limestones is marked on the western contact by strong cupriferous metallization, and the limestone, in turn, where it rests against the quartzite, has heavy bodies of soft ferruginous, gonian-like material, giving promise of large bodies of copper ore below. The quartzite croppings, in their turn, give abundant evidence of impregnation by copper by large superficial coatings of green carbonate of copper. It would appear that the great reef of quartzite, extending for miles and some 200 feet in thickness, had furnished a considerable part of the copper ore deposited in the limestone below and along the planes of contact of the two formations, the insoluble quartzite forming the foot wall and the soluble limestone the hanging wall. Under such conditions we have good reason to expect that the cupriferous solutions have dissolved the limestone, forming branches and cavern-like deposits of ore replacing the limestone.

There are two known planes of contact where copper ores have been found under such conditions. They are locally known as the first and second contacts or the eastern and the western. One is at the junction of the porphyry dike with the limestone, and the other is at the contact between the limestone and the reef of quartzite.

NARRAGANSETT CLAIM.

This claim was located in 1879 by J. K. Brown, has the usual size, 1,200 by 600 feet, and covers the croppings of iron ore and copper ore marking the eastern contact of the limestone with the porphyry dike.

It has been prospected and worked sufficiently to show that there is a continuous body of copper and iron ore. The ledge is generally about 4 feet in thickness, consisting of ferruginous copper ore from which shipping ore is culled by hand. It is a good smelting ore. There are some portions in which silica occurs in the ledge with the iron, but the copper is usually in the form of the rich sulphide known as copper glance, or as the carbonate.

The vein is opened by crosscut tunnels and by open cuts. The steep hillside invites this mode of attack. There are four such tunnels leading through the porphyry to the vein, which is then followed down by incline shafts, the deepest of which is only 60 feet below the level of the tunnel. The inclination or dip of the ore and of these inclines is about 52 degrees, getting steeper as depth is gained.

The dip of the vein in the upper portions is southerly and westerly toward the quartzite, but the normal dip of the formations, including the quartzite, is eastwardly. It appears probable that this dip of the upper portion of the vein and the inclosing rocks is due to the crushing down and bending over of the formations by their weight on the very steep hillside. The sections remind one of the section of the upper parts of the Comstock lode, which were so bent over near the surface as to give a westerly dip to the lode at the Ophir and the Guild & Curry claims opening out the upper portions like a fan and dipping westwardly, while the true dip of the footwall was eastwardly. A crosscut westwardly from the bottom of the deepest shaft has recently cut a considerable body of ore in the limestone under the porphyry dike.

A considerable quantity of shipping ore has been taken out of this claim. As the returns from the smelter will give a better idea of the percentage value of the ore in copper than can be had from hand samples, the following have been copied from such returns:

Shipments from the Narragansett, 1896.

Weight.	Copper.	Weight.	Copper.	Weight.	Copper.	Weight.	Copper.
<i>Pounds.</i>	<i>Per cent.</i>	<i>Pounds.</i>	<i>Per cent.</i>	<i>Pounds.</i>	<i>Per cent.</i>	<i>Pounds.</i>	<i>Per cent.</i>
35,990	23.75	10,200	22.10	35,185	21.20	77,840	16.87
35,183	23.70	19,395	25.70	32,803	24.41	37,100	24.50
29,510	20.50	67,100	22.20	47,978	21.79	616	16.11

The sample from lot 77,840 pounds assayed 22.20 per cent by the cyanide wet assay at the Arizona School of Mines (No. 1274), but was settled for by dry fire assay at 16.87 per cent by the smelter. The same assay (No. 1274) showed the presence of one-quarter of an ounce of gold per ton of ore. This is not sufficient gold per ton to be allowed for by the smelter, but it accumulates in the copper, and is saved if the black copper is refined by the electrolytic process, and is therefore an element of profit to the smelter, making the ores more desirable for sale, and causing them to command a higher price or preference over ores that are not gold bearing. It is also an important element of profit to parties who own both mines and a smelter, for there are methods of obtaining most of the gold in portions of the black copper, thus increasing the contents of gold up to the quantity essential to the economic separation of it from the black copper.

BACKBONE AND ECLIPSE CLAIMS.

Directly above the Narragansett mine and lying along the summit or backbone of the range and covering the plane of contact between the limestone and the quartzite, there are two claims, 1,200 by 600 feet, one patented, known as the "Backbone" and the "Eclipse." These claims cover what is known in the camp as the "second contact," or the contact place between the basal quartzite and the beds of limestone. All along this plane of contact there are strong evidences of the extensive mineralization of the strata by copper ore. The outcrops are soft and highly colored with oxide of iron for a width or breadth of from 15 to 20 feet, including a body of yellow-colored shaly slate-like material, apparently discolored by the decomposition of the ore. This coloration and softening of the rock is especially noticeable upon the Eclipse claim, which abuts upon and forms the continuation of the northern end of Backbone claim.

There are several openings on the Eclipse showing ore of good quality. There are crosscut openings at surface revealing the decomposition of the rocks near the contact and deeper cuts, pits, and shafts showing that ore occurs of good quality. One of the shafts, about 100 feet deep, has at the bottom a crosscut drift showing, according to Mr. Thomas Deering, vein matter with ore mixed through it for a distance or breadth across the formation of 37 feet. Of this distance 4 feet next to the foot wall is compact sulphide ore, a good ore for smelting. A sample from this 4 feet of ore sent by Mr. Deering to the Arizona School of Mines, Tucson, yielded 24 per cent of copper.

SMELTING WORKS.

At Rosemont, about a half a mile east of the summit, a first-class copper smelting plant has been erected with a capacity of 60 tons of ore a day. This is at present standing idle while the Lewisohn Brothers are developing some of their mines. When in blast these works are an excellent and convenient market for the ores of the district from outside claims. While the smelter at Tucson was running under the management of Mr. J. Francis some of the ores produced by the Narragansett,

the Backbone, and the Eclipse claims were sent there and sold, but since the closing down of this Tucson smelter, ores have been shipped to El Paso for reduction. It is possible that a nearer market might be found at the furnaces of the Copper Queen, at Bisbee.

Hauling from Rosemont to the railway at Vail's siding costs about \$3 to \$3.50 per ton for ores.

There is an abundance of oak timber on the hills and slopes about the mines, and large pine timber can be had in the higher ridges of the range to the southward where there are extensive forests.

During the rainy season there is a superabundance of running water, but in the dry part of the year there is a supply from springs only. There is a fine spring and a mill site in connection with the patented Eclipse claim.

GLOBE COPPER DISTRICT.

Globe district is situated on the northwestern slope of the Pinal Mountains, about 23 miles from the famous Silver King Mine. In the period from about 1876 to 1883 this district attracted much attention by reason of many discoveries of rich silver veins. At present mining activity is confined chiefly to copper.

The first location on what is now considered the main copper-bearing belt was made in 1875 by the locators of the Silver King Mine, and it was named "The Globe."

The location is now held and worked by the Old Dominion Copper Company, which also has two other locations on the same vein—the "Southwest Globe" and the "Globe Ledge."

The vein is described as following a contact, having for a foot wall diorite and for the hanging wall limestone containing fossils of the Carboniferous period. On the west side of the outcrop there is a capping of a volcanic rock referred to trachyte, which conceals outcrops in that direction. That good ore occurs there was shown by Dr. Trippel by a drift west from the money shaft, and openings were afterwards made through the bed of trachyte and have been extended downward on ore for over 300 feet. This deposit was regarded by Dr. Wendt as a fissure vein, and he notes that in approaching the ore body through the long adit tunnel running lengthwise of the claims, the conditions are similar to those observed in the Long-fellow mines at Clifton and the Queen and Prince mines at Bisbee, especially as regards the decomposition and kaolinization of the rock.

The ores are mostly oxidized, but large bodies of sulphides have been found on the second and third levels, with oxidized ores below them. They carry a large amount of silica and frequently require heavy additions of lime and iron to the charges.

THE UNITED GLOBE MINES.

The mines have the "Hoosier Ground," consisting of some eighteen locations on the main lode, including the Hoosier, Centralia, Gladiator, Transit, and Nevada. The Buffalo group includes the Buffalo, Cleveland, and Mark Twain. In these mines we find practically the same conditions as in those of the Old Dominion claims. The vein, however, changes its trend somewhat, lessens in its angle of dip, and is not so wide. The limestone also becomes more magnesian. Sulphide ore in bodies has not yet been found, and the ore is a little more siliceous than those described. Samples taken from the veins for a week gave the following for the average composition for the principal substances:

	Per cent.
Copper	14.6
Iron	19.3
Silica	29.4
Lime	13.1
Magnesia	4.2

The present output of the camp derived from two water jackets is, on an average, 3,000 pounds of black copper daily and of excellent quality, assaying usually as follows:

	Per cent.
Copper	97.60
Silver .....	.52
Gold	Trace.
Iron	1.01
Sulphur	Trace.

The Old Dominion Company put up two 100-ton smelting furnaces. The production of black copper from November 1, 1895, to August 1, 1896, was reported as \$840,000 pounds.

Since the last report there has been a change of ownership and a reorganization of the company under the same control and largely the same ownership as the mine

at Bisbee. According to an extended description of the camp in the "Silver Belt," the United Globe mines was organized as a company for the mining and smelting of copper in 1892.

The officers of the company are: Prof. James Douglas, president; Joseph Van Vleck, vice-president; George Notman, secretary; all of whom hold like positions in the Copper Queen Company, of Bisbee. However, the two companies are not in any other respect identified, the personnel of the respective boards of directors being different.

The property of the company comprises some thirty mining claims on the Globe copper belt, north of the town of Globe, a smelting plant, and other surface works, and a sawmill on Pinal Mountain. None of the claims, except the Buffalo—and the Hoosier, perhaps—were anything more than favorable prospects when purchased by the company, and the smelter was a crude affair of one small water-jacket furnace.

In August, 1895, the work of remodeling and enlarging the plant began and has progressed steadily since. In this work of improvement the superintendent has had many obstacles to contend against, chief of which was the difficulty of getting the necessary lumber and the slow transportation of machinery and other supplies. Happily, these annoyances are now about at an end, and the visitor to the United Globe will see one of the most complete and substantial plants for the handling and smelting of copper ores in Arizona.

The smelter has been practically rebuilt, and the smelter building and tramway terminal cover an area of 189 feet square. The buildings are spacious, thorough in construction, and planned for convenience and facility in handling the ores, coke, copper, etc. The principal furnace is a 126 by 38 inch, elliptical water jacket, of the Douglas patent, built by The Samuel L. More & Sons Company, of Elizabeth, N. J. The new feature (the invention of Prof. James Douglas) is the leader of the blast through the water compartment before entering the furnace, causing the heating of the blast with a corresponding cooling of the water and a more even temperature around the crucible. The theoretical capacity of the new furnace is 125 tons per day, but the actual capacity, smelting the oxide ores of the district, will likely be from 150 to 175 tons. A 36-inch jacket, of the ordinary pattern, will also be employed.

The most important addition to the plant is the tramway, of the improved Bleichert pattern, built by the Trenton Iron Works, Trenton, N. J. The line runs from the Buffalo ore bins to the smelter, a distance of 3,000 feet. Ore from the Hoosier shaft will be hauled 1,500 feet in cars drawn by mules to the Buffalo ore bins and there transferred to the cable tramway.

At the mines the principal development work is directed toward the openings of the Hoosier claim and adjacent territory between it and the Dime, in Copper Canyon. For this purpose there has lately been erected a small hoisting plant on the Hoosier shaft, together with the main blacksmith and carpenter shops, a storehouse and office for the mine foreman. Underground work has just been initiated to crosscut from the main foot wall into the limestone, where it is supposed that the main ore bodies will be encountered.

An important strike of rich ore in a considerable body was reported in this mine in April, 1897. The several mines were then supplying more ore than could be smelted in the 30-inch jacket then in operation.

The work in other portions of the Hoosier territory for several months past has consisted of making thoroughfares and openings for necessary ventilation, and generally to connect the principal claims of the Hoosier group with the main outlet at the Hoosier shaft.

Little or no work has been done for several months in the Buffalo mine.

The old road to the Big Johnnie claim has been repaired and a new portion constructed leading to the Buffalo ore bins, and over which it is proposed to utilize the traction engine which some years since did duty for the Copper Queen Company in hauling ore from the White Tail Deer mine to Bisbee.

The Big Johnnie, Birdnest, and Buckeye claims will furnish some ore to the smelting works, and their products will be hauled by the engine.

The outlying claims are connected by telephone with the mine foreman's office and the smelter.

A dynamo will shortly be added to the smelting plant for its lighting and the company's buildings near the works.

In January, 1897, at the United Globe, work on the upper terminal of the cable tramway was completed. At the smelter the ore and rock bins under the crushers are being constructed and many lesser details looked after. The stacks have been erected over the furnace, the floor laid in the engine and blower room, and the smelter practically complete and ready to begin the production of copper, and it is expected that one 36-inch jacket will be blown in about February 1, or soon thereafter. Progress is reported in mine work. The Hoosier shaft is down about 280 feet and sinking proceeds uninterruptedly.

In March, 1898, the company was preparing to start the new sawmill by April, and had let a contract for logs.

Commissioner W. P. Hunt, of Globe, reports for 1897 that the Globe mine had produced 70,000,000 pounds of ingot copper, and that the owners of the Copper Queen, at Bisbee, have in Globe district about thirty-five contiguous claims.

PINTO CREEK MINES.

He also reports a promising mineral country on Pinto Creek north of Webster Gulch, which is known to be rich in gold, copper, and lead. It is 16 miles west from Globe. Several companies have been organized to work some of the claims; amongst these are the Pinto Creek Mining and Smelting Company,* the Kanar Gold Company, and the Black Warrior, in Webster Gulch. The Continental mines are 14 miles west from Globe.

THE BLACK WARRIOR, OF GLOBE.

In January, 1897, the Black Warrior Company reported progress in the development of their several claims. The shaft on the Black Copper was down 175 feet, and since Supt. W. W. Hill's return last week a third shaft has been added and sinking goes on at the rate of 6½ feet or more a day, and three sets of timbers are put in every other day. The shaft, an incline, is being sunk parallel to the ledge on the foot wall. The showing of ore in the Black Copper is enormous, proving it to be one of the largest deposits of copper in Globe district.

The shaft on the Dadeville is down 71 feet, and they are now crosscutting to ascertain the width of the vein, which is at least 20 feet, the ore being of good average quality.

The Jewell, 4 miles west of the Black Copper, is considered one of the most valuable claims controlled by the company, since it is expected to yield the iron and lime flux required to smelt the siliceous ores of the Black Copper ledge. The tunnel in the Jewell has been driven 230 feet, and the expectation is that the ore will be reached within a few days. The ledge is very large and will supply not only flux, but ore of excellent quality.

The company expects to erect a water-jacket furnace of large capacity as soon as practicable, but it will probably be several months before it is on the ground and ready to be blown in. Superintendent Hill, who has had wide experience in the reduction of copper ores, anticipates no serious difficulty in smelting the ore of the Black Copper. With the ores and flux broken to an even fineness, a heavier charge fed above the tuyer line, and the fire kept well underneath, there is no reason why smelting should not prove successful.

In March, 1898, the company was reported as shipping ore from the Montgomery claim, which is one of fifteen claims belonging to the company situated in Webster Gulch. The Montgomery is a phenomenal mine, in that it has proved a paying proposition from the grass roots. The ledge is 20 feet wide and the ore is cheaply mined, averages 15.7 copper, and is of a character that makes it desirable to flux with the ores of the United Globe mines, which company has contracted to smelt it.

James A. Fleming, president of the Black Warrior Company, notwithstanding the many discouragements which he has had to face, has never lost confidence in the property, and is now practically the sole owner. About 20 tons of ore are being delivered to the United Globe smelter daily, at a cost for mining and hauling of \$3.25 per ton, leaving a handsome margin of profit of from \$10 to \$12 per ton. Mr. Fleming informs us there is enough ore in sight to insure a continuation of shipments for a year.

Other claims in the group have been more or less developed, some of them with very satisfactory results, and there is no doubt but the Black Warrior Copper Company has one of the most valuable properties in Globe district.

The Silver Belt, published at Globe, in September, 1897, described the following additional claims:

THE JOYCE.

Hugh Higdon and H. C. Haverly have a good copper claim in the Joyce, in Webster Gulch, adjacent to the Black Warrior property, and upon the same ledge. They have sunk 30 or 40 feet on the ledge, and have ore of a very good grade, and apparently there is an abundance of it. Work on the claim, suspended for several weeks, will be resumed within a few days.

THE CONTINENTAL.

An English syndicate has become interested with N. L. Amster in the bond on the Continental group, 11 miles west of Globe, and the development of the property will

* The incorporators are: T. R. Ashbrook, George W. Jackson, M. O. Blackmore, James M. Wilson, Donald Campbell, and Grant S. Watkins, of St. Joseph, Mo., and Mrs. Winnie Ferguson, of Globe, Ariz. The company has been organized for the mining and reduction of copper and gold ores principally. The capital stock of the corporation is to be \$1,000,000.

be commenced within a few days. The first work contemplated is to drive a cross-cut tunnel 500 feet, and continue the present shaft down 150 feet to connect with the tunnel. E. D. Stoutz, M. E., is expected here to-day from New York, to assist Mr. Amster in directing the work.

The Continental is a well-known property that has been several times favorably reported upon, and is believed to be one of the most promising copper properties, for the amount of work done, in Globe district. The parties who have become interested in the Continental have ample capital and propose to thoroughly exploit the mine.

THE BADGER.

This, the principal claim of the group in Lost Gulch, owned by Louis Sultan and James Graham, continues to show improvement. The shaft, 280 feet northeast from the original location, has been sunk to a depth of 125 feet. The ledge averages $3\frac{1}{2}$ feet in width the full length of the shaft, and numerous assays of the ore show average returns of about \$20 per ton in gold. Below the 60-foot level the character of the ore has changed to a sulphuret, and again below the sulphuret a white quartz ore was struck, assaying in gold over \$100 per ton. Free gold is visible through the quartz. There are no further developments to report on other claims of the group.

LOST GULCH MILLING AND MINING COMPANY.

Activity marks the operations of this company. The mill is running steadily and the supply of ore is ample. The usual force is employed in the mine, and considerable development work is being done.

This company started their 10-stamp quartz mill in December. It is one of the most complete mills in Globe district, furnished with the newest and most approved appliances for saving the yellow metal.

The following figures obtained from the late Dr. Alexander Trippel, regarding the cost of producing copper at Globe, are interesting. For many years the average of the copper ores of Globe was from 14 to 15 per cent of copper, and at that percentage the metal cost 5 cents a pound to produce. This sum included all the expenses, including the management, administration, etc. For a period of about one year the best ore averaged from 17 to 19 per cent monthly. Coke cost \$53 per ton at the smelter, and the $98\frac{1}{2}$ per cent black copper cost 4.3 cents per pound.

COPPER AT DRIPPING SPRINGS.

Copper mines at this locality, near Skinnerville, 25 miles south of Globe, attracted considerable attention in 1897, especially the Copper King and Rattler claims, owned by W. H. Sutherland.

COPPER CLAIMS NEAR FLORENCE.

According to the Tribune there are promising copper-bearing claims about 10 miles east of Florence and 3 miles south from the Gila River, near the Florence and Globe road.

About twenty years ago John D. Walker located and worked a mine in this district, sinking a shaft to the depth of 30 feet, from which he shipped 5 tons of ore that realized, it is said, the sum of \$2,000 in silver and copper. With depth the silver became less and the copper more, and as he was looking for a silver mine, which he found in the Vekol about that time, this mine was abandoned and remained so until a short time ago, when W. R. Stone and A. T. Colton, not being afraid to do some work on an abandoned claim, located and worked the same, finding the ore extensive and continuous, and have opened up by shafts and crosscuts large bodies of high-grade ore on the mines known as the Georgiana and Marian, from which they have shipped a large amount of ore.

William M. Griffith and others have done more than 100 feet of work in shaft and drifts on the Half Moon mine, from which has been taken a large dump of ore that will assay, without assorting, at least 20 per cent in copper. One sample across the width of the shaft gave an assay of \$9.35 in gold. The Accumulation mine, on which has only been done the location work in a shaft 10 feet deep, shows copper glance assaying 70 per cent copper. This mine is owned by Dr. J. M. Hurley and W. R. Stone.

The Madam Denny mine shows a ledge at least 10 feet wide of copper ore, and that taken from the shaft on development work will average 15 per cent in copper. This mine is owned by Mrs. Kate M. Stone.

COPPER ORE NEAR CASA GRANDE.

Some very interesting samples of siliceous copper ore and carbonate of copper have been sent in from time to time from the districts about Casa Grande, but there is little or no reliable information regarding the nature or extent of the deposits.

COPPER SMELTING AT TUCSON.

The copper furnaces of the Tucson Mining and Smelting Company, under the management of Mr. Francis, renewed operations in 1896, and were supplied for most of the time from the mines of the region about Tucson, chiefly from Hughes camp, from Olive camp, and the Sierritas. The copper ores received from July 1, 1895, to June 30, 1896, amounted to 2,200,000 pounds. The copper bullion shipped during the same period weighed 265,751 pounds and the copper matte 228,548 pounds. In April, 1897, a successful run was made upon 180 tons of ore, containing gold and silver, as well as copper. This lot of ore consisted of the output of many different prospects or claims. One consignment of about 25 tons of high-grade ore came from Sonora, Mexico.

During the winter of 1897 and 1898 the smelter closed down and has not been in blast for several months.

COPPER IN THE DRAGOONS.

There are many copper-mine locations in the Dragoon Mountains, east of Tombstone. Some of these deposits, formed apparently as the result of metamorphism of limestone strata by intrusive dikes of plutonic rock, contain quantities of a green garnet, which, being heavy and mingled with the ore, is apt to deceive many regarding the richness of the ore. The garnet also is objectionable in the furnaces of the smelters, as it makes a thick, pasty slag and impedes the smelting.

A furnace has recently been erected by the Golden State Company and was blown in the summer of 1898. This furnace is reported as having a capacity of 30 tons of ore a day. Coke is hauled from Cochise Station on the Southern Pacific Railway. Some difficulty was experienced with the garnetiferous ore, but no further report has been received.

Another property farther south in the same district is the Black Diamond, which gets its name from an immense outcrop of lustrous black iron ore. It crops out along the contact of a dike of porphyry with beds of limestone, and is composed of specular iron, magnetic iron, and quartz intimately mingled so as to form a very hard mass. Through this mass there are strings or patches of fine copper ore irregularly distributed and not as much segregated and separated from the mass as is desirable. The ore when pure consists of bornite, the variegated copper sulphide known also as cruescrite. It is a beautiful ore and a desirable one, as it also carries silver. By the decomposition of the stringers and bunches of this copper ore a considerable amount of copper green staining results.

The development of this deposit consists of open cuts, tunnels, and a shaft about 60 feet deep, with a drift and crosscut at the bottom, most of which is in iron ore too lean in copper to pay for extraction. Some good ore has been selected from the various openings and has been shipped to smelters and gave good returns.

The Black Diamond is near to the summit of the Dragoons, nearly west of the Commonwealth mine, at Pearce, about 6 miles distant. The altitude is about 6,000 feet. There is a large development of stratified limestone, sandstones, and quartzite, forming the crust of the range at that point and extending northward to and beyond the "South Pass."

COPPER CAMPS NEAR TUCSON.

In July, 1897, the opening up of a new copper camp 33 miles from Tucson was reported. The claims are located at the old Hoffman camp, Twin Buttes, 6 miles westerly from J. K. Brown's ranch, and are owned by the John Ellis Company. One group of seven claims and another of eight claims are owned by Jim Sheridan, A. C. Malin, and Phillip Constance, the county surveyor.

AZURITE MINES.

The Azurite mines, formerly the Mineral Hill group of mines, are well developed, about 3,300 feet of work having been done and more than \$100,000 worth of copper ore extracted and sent to the smelter by the various parties who have leased the property. The deepest working on these mines is about 225 feet, there is between two and three thousand tons of ore on the dumps which will average from 8 to 10 per cent copper. These mines carry a fine grade of ore, free smelting, as there is sufficient iron and lime carried in the ore to make it self-fluxing or free smelting. Ore under 15 per cent copper does not pay to ship on account of heavy smelter charges and freight rates.

An important strike was made during the winter in the east drift of the 200-foot level. An ore body was uncovered which measured a fraction over 5 feet in width. Over 3 feet is black sulphurets, which gave returns of 34 per cent copper, 18½ ounces silver, \$3 gold.

On the hanging wall there was 1½ feet of green carbonate, which gave 10 per cent copper, 9 ounces silver, and a fraction over \$3 gold.

Some ore taken from the cropping on the Crest mine, located at an altitude of 500 feet from the level of the shaft's mouth and of the 700 feet from the lower levels, show copper 8½ per cent, 17 ounces silver, and some gold.

TWIN BUTTES MINE.

This name covers a group of eleven claims under the ownership of Ellis Baxter and "Irish." The claims are south of the Azurite group, and show copper ore which contains both silver and gold. The Bain group, about half a mile east, show similar ores.

OLIVE CAMP.

For the last ten years the Olive camp, in the Pima mining district, located southerly 18 miles from Tucson, has been a steady producer in a greater or less degree. When silver was at a fair value many thousands of dollars were taken out in high-grade ores and shipped to the various reduction works of the country, and as silver depreciated in value none but the higher grades of ore was shipped, and the output naturally decreased.

More recently attention has been turned to the development and shipment of high-grade copper ores which abound in that district, as well as some lead ores, so that the district continues as a substantial producer. Recently some very promising developments have been made and copper-ore shipments continue, but none but high-grade ores are shipped on account of freight rates and high smelter charges. But time will obviate this, as reduction works must soon be established in the district, as the large amount of low-grade ore accumulating on the dumps will make an investment most profitable.

SAN XAVIER MINE.

This property, 20 miles south of Tucson and easily accessible by a splendid natural road, has been reopened during the year by the enterprising hand of Gen. L. H. Manning. The property has been opened up by two shafts, each of them being fitted with steam hoists, and thousands of tons of ore have been extracted from each shaft and shipped away to El Paso for reduction. This ore is not very high in grade, but the quantity and ease of extraction and its good qualities as an ore to mix with other ores at the smelter have caused it to be in great demand. For a long time some 40 to 50 tons were shipped away to El Paso daily.

The development has but just commenced. A crosscut recently developed a fine body of yellow copper ore. The bulk of the ore so far taken out has been valuable chiefly for its lead and silver. Zinc is also present.

SNYDER COPPER.

These claims have been worked by Mr. Douglas Snyder and regular shipments have been made.

HELMET PEAK.

The Helmet Peak Mining Company, with S. M. Franklin as president, and B. B. Roberts, superintendent, is expected to start active operations very soon.

TABLE MOUNTAIN COPPER.

It is understood that there has been a considerable development of copper ore at Table Mountain beyond the San Pedro during the year. No report or description of this property has been received, but the following is taken from one supplied to the Arizona Citizen in March, 1898:

"About 16 miles to the eastward of Mammoth, and over the pass at Table Mountain, is the property of the Table Mountain Copper Company. The company now has fifty or sixty tents pitched, and these constitute the present living and business apartments. Lumber and material are being hauled into the camp, and more comfortable and commodious quarters will soon be erected for the accommodation of the company and its employees. About 75 men are now employed in the camp.

"The company has expended several thousand dollars in making a first-class wagon road from their camp to a main road leading to the Southern Pacific Railroad at Willcox, and over this road all the supplies and machinery will be transported to this camp.

"This property is being developed by means of an open cut, and resembles a large quarry rather than the usual mine. The face of the cut has a vertical thickness of about 50 feet, and the surrounding croppings extend about 3,000 feet laterally.

The ore exposed by this working is black oxide and carbonate of copper. At present there are no sulphides in sight, but there is indication and hope that depth may develop even greater richness than is shown on the surface. Of course, there is only one method of ascertaining the facts, and that is development. This will be done by the present management.

"The ore contains silver and gold in addition to the copper. The copper values average from 12 to 13 per cent. On the dumps and in plain sight are many thousands of tons of ore which are supposed to possess good smelting value. It is stated on good authority that there is quite a body of the ore that carries gold to the value of \$40 per ton.

"All preparations are being made for the erection of a smelting plant of sufficient capacity to work the output of the mines. The heavy stone and timbers are already in place, and much of the machinery which has been purchased has been delivered at Wilcox and is being removed to the scene of operations as rapidly as possible. A portion of the equipment of this plant will consist of two copper furnaces.

"Captain Burgess, who is general manager of the Saginaw property, occupies the same position with this company; Mr. William Jenks is the superintendent and E. A. Clark is mine foreman.

"The peculiar formation of this property and the position of the machinery will render it possible to handle the ore very economically.

"Following in the wake of this company and its energetic development there has sprung up quite a lively camp at Table Mountain. There are general merchandise stores, restaurants, butcher shops, saloons, of course, and lodging houses, and business in all departments is reported as very brisk and consequently satisfactory."

SAGINAW.

Extensive developments and improvements have been made during the year. The installation of large pumps for raising water has been made on the borders of the Santa Cruz, and water is now supplied to the camp from this source. A costly mill and a smelter have been erected at the mines.

MOHAVE COUNTY COPPER.

Important indications or "prospects" of copper-bearing ledges are reported from Mineral Park, Mohave County. The ores appear to be the yellow sulphide and copper glance, in veins traversing crystalline rocks.

COPPER ORES ALONG THE COLORADO.

The rich copper conglomerates of the vicinity of La Paz attracted great attention about the year 1865. Very rich masses of nearly pure vitreous copper were taken out, but the average does not appear to have been sufficiently high to justify working.

In the vicinity of Castle Dome there are rich copper ores in small quantity which carry free gold. These appear to be more in the nature of veins than of deposits like those of La Paz and Planet.

Of the copper mines of the Hareuvar Mountains no information has been obtained.

COPPER MINES OF THE AJO.

These historic mines in Maricopa County, which in the early days of the occupation of Arizona by the whites sent out wagonloads of native copper and red oxide, and which have largely added to the fame of the Territory as a copper producer, continue to yield small quantities of ore, which, being carefully sorted by hand, is rich and valuable enough to bear the cost of hauling and transportation to the smelters. The veins are not large, but are numerous and are worked in a small way by prospectors. The specimens from these veins are usually held together by ramifying ragged masses of pure copper enveloped in red oxide of copper. The original ore was probably copper glance. The ore is shipped out by way of Gila Bend, on the Southern Pacific Railroad.

COPPER GLANCE, HUACHUCA MOUNTAINS.

The Huachuca Mountains, in the southwest corner of Cochise County, have important mines and "prospects" of copper. The Copper Glance claim, opened by Mr. Samuel Donnelly, is about 30 miles from Fairbanks, on the side of the Huachuca Mountains. The ore is high grade, consisting, according to specimens sent to the museum of the School of Mines, of copper glance. Considerable shipments have been made. The ore carries both silver and gold in addition to the copper.

HILLSIDE COPPER MINES.

A region south of the Hillside silver and gold mines, upon Sycamore Creek, Yavapai County, is remarkable for the abundance of siliceous copper ore in small seams traversing the rocks. Chrysocolla and some black oxide abound, to the exclusion of the usual carbonated and ferruginous ores.

AMAZON GROUP, YAVAPAI COUNTY.

The copper claims, known as the Amazon Group, are upon Castle Creek, in the southern portion of Yavapai County. They are known as the property of Bob Groom. It is reported that portions of the large ferruginous outcrops assay well in gold.

YAVA SUPAI COPPER.

A new and apparently very important discovery and development of copper ore has been made since my last report by Mr. M. Page Minor, of Williams, Coconino County. Samples forwarded by him to the Arizona School of Mines were so promising in appearance and percentage of copper that he was encouraged to open up the ground. He has named the claims the Yava Supai, following the name of the tribe of Indians inhabiting the mesa and borders of the Grand Canyon of the Colorado, near whose reservation these mines appear to occur.

The ores, besides the usual association of oxides of iron and of copper carbonates, consist largely of a variety of trydrous silicate of copper rich in the metal. The silicate has a peculiar olive-green color and bronzelike luster, with an iridescent tarnish. It is very fusible, and yields up its copper easily with fluxes. It appears, therefore, to be a very fine ore for smelting. Its exact chemical constitution is now under investigation, as it appears to be different from the usual composition of the silicate of copper.

In regard to the form of occurrence and the extent of this deposit of copper ore, Mr. Minor at my solicitation writes substantially as follows:

You ask if the copper belt is under lava rock. No; it is under limestone and white sandstone. The belt is first encountered as "blanket ledges," which are from 2 feet to 8 feet thick. Under these "blanket" ledges is more limestone and white sandstone. Several claims show vertical ledges or deposits of the copper ore.

At Williams and for a distance of 20 miles northward the upper crust of the earth is "mallapi" (mal pais). Under this lava capping to depths of from 2 to 50 feet or more we find limestone, then iron-stained ground and copper ore. These indications of deposits of copper are believed to extend for a distance of 20 miles or more. Prospectors of the country to the north of the canyon report similar indications of copper extending from the rim of the canyon to St. George, Utah. A later communication, under date of May 29, 1898, states that the developments so far consist of a ledge 3 feet in width, with an opening on it 15 feet deep and still in ore. It has a dip of about 40 degrees. The ore averages over 38 per cent of copper, 25 ounces in silver, with traces of gold. "I expect to take out a sample shipment of from 20 to 25 tons for the new smelter at Williams."

The opening of this copper property may be considered as partly, if not largely, one of the advantageous results of the system of first-class assays at a nominal cost provided by the legislature of Arizona for the benefit of the prospectors and miners of Arizona. The locator of these claims very handsomely acknowledges his indebtedness to the Arizona School of Mines by writing: "I thank you for the favors you have heretofore shown me, and I assure you that by your good letters you encouraged me to the extent of causing me to open up these mines."

It is interesting to note further in this connection that as early as May, 1891, an article in the *Journal-Miner*, of Prescott, gave an account of the discovery by J. A. Healey of blanket ledges of ore in the sides of Cataract Canyon. No precise description of this ore was given, except that an assay showed some \$30 in gold and considerable silver.

Dr. Jones, of Phoenix, many years ago visited the homes of the Supai Indians and reported considerable deposits of argentiferous lead ore.

SAN CARLOS COPPER CLAIM.

Claims of this name were located in August, 1870, for Charles Miles, son-in-law of C. D. Henry, of Seven Cottonwoods. They are about $7\frac{1}{2}$ miles south of the Cottonwoods toward the Gila River. Copper ore occurs here in vein-like layers associated with quartz in granite. These layers are irregular in extent and form and are not continuous, but crop at intervals and irregularly. The seams vary from two inches to two and a half inches at the broadest places of the undecayed ore. This ore is largely silicate and carbonate derived from the decomposition of vitreous copper sulphide. The incline shaft, in December, 1881, was about 30 feet deep at an angle of 40 degrees.

RAY COPPER MINES.

These claims are in the eastern end of Pinal County, on Mineral Creek, a tributary of the Gila River, and about 6 miles from Riverside. There are several claims in this group on and about Ray Hill. The Ray claim, in 1883, had been opened to a depth of 80 feet vertically, or 130 feet on the incline, below the tunnel level. The tunnel extends in a north and south direction 190 feet. The copper ore is contained in a bed of felsite, which is considerably decomposed and softened. The ore is different from the usual oxidized compounds which enrich rocks of the same class in the Clifton district and elsewhere in central Arizona, but the arrangement of the ore masses in the bedding of the rocks is apparently similar. The richest portions appear to lie in lenticular bunches trending in a northwest and southeast direction and separated by barren ground. Concentration will probably be necessary to secure profitable results. It is claimed that a sample of the copper-bearing stuff averaging only 3.7 per cent can be concentrated so as to give a product of ore averaging 23 per cent. The presence of both gold and silver is claimed for this ore. There has been extensive underground working aggregating over 1,000 feet of levels and tunnels, but as the mine has been shut down for several years it is not probable that many of these openings are accessible.

The importations of copper into the customs district of Arizona during the year ending June 30 were as follows:

Year.	Quantity.	Value.
<i>Copper ore and regulus.</i>		
1893.....	Pounds. 383,380	\$1,981
1894.....	144,085	7,207
1895.....	17,589	880
<i>Copper in pigs, bars, and ingots.</i>		
1897.....	153,271	7,870
1898.....	22,160,035	1,365,703

The importations of copper during 1898 were for immediate transportation and export to Europe by the way of New Orleans, over the Guaymas Branch and the Southern Pacific Railroad, and are returned as ore export of foreign merchandise from New Orleans. This copper, as before stated, is chiefly from the mines of the Boleo Company, upon Lower California, nearly opposite Guaymas.

Copper production in Arizona, 1891-1898.

[In pounds.]

	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.
Arizona Copper Co.	5,673,611	5,893,533	7,871,819	9,935,812	11,308,910	13,042,000	13,727,911	.....
Copper Queen	13,022,957	12,916,414	13,795,618	12,688,372	15,741,731	23,298,150	23,999,873	.....
Commercial .....	.....	282,51	273,340	90,805	.....	46,040	.....	.....
Detroit	4,194,672	1,918,594	4,942,728	5,777,744	8,790,128	7,016,248	8,405,188	.....
Old Dominion	6,982,101	7,698,297	7,685,293	4,839,386	.....	5,650,000	2,000,000	.....
United Verde	7,350,087	9,524,492	9,121,146	10,904,453	16,491,402	23,327,950	31,355,025	.....
United Globe	2,302,705	.....	.....	.....	.....	2,020,565	1,241,975	.....
Other mines	2,368,506	119,833	108,741	214,536	997,232	344,268	290,000	.....
Total	41,894,606	38,383,116	43,773,675	44,531,108	48,329,403	73,745,821	81,019,922	49,503,294

¹ January-June.

V.—SODA, SALT, SULPHUR, ETC., COAL, PETROLEUM, AND TUNGSTEN.

Large deposits of sulphate of soda in association with hilate (rock salt) occur in the Verde Valley a few miles south of old Camp Verde. They form large banks and hillocks slightly discolored by soil and dust. It is the mineral known to mineralogists as "thenardite" and to druggists as "Glauber's salts." It is a powerful purgative and has this effect in a marked degree upon the cattle which resort to it. The mineral is quarried out in large blocks and is sold to rancheros and stockmen for their cattle ranges. The salt occurs in crystalline blocks, very clear and pure, in the midst of the thenardite, and is not easily separated from it. Analysis shows that this mineral contains about 53 per cent of sulphuric acid and 43 per cent of

soda. The mineral called "glauberite" occurs at this locality and is sometimes altered to calcite. The crystals are from half an inch to two inches or more in length, as shown by me in a paper in the American Journal of Science, 39, 43, 1890, which follows:

THENARDITE, MIRABILITE, GLAUBERITE, HALITE, AND ASSOCIATES OF THE VERDE VALLEY, ARIZONA.

The deposits of sulphate of soda of the valley of the Verde River near the military post of Camp Verde have long been known and extensively quarried by the rancheros of the region as a substitute for salt for cattle and horses. The occurrence of thenardite in Arizona was first made known to science by the late Prof. B. Silliman in 1881,* but he had not visited the locality and it has not been described. A recent visit to the place, and a somewhat hurried and superficial examination, enabled me, however, to collect and identify other allied species in association with the thenardite, and a peculiar pseudomorph of carbonate of lime after glauberite.

The deposits of the thenardite and the associated minerals are of considerable magnitude, covering several acres in extent, and reach a thickness of some 50 or 60 feet or more. They appear as a series of rounded hills with sides covered with a snow-white efflorescence and a greenish-colored and yellow clay at the bottom and top, partially covering the saline beds from view.

These beds are doubtless remnants of a much more extended deposit which occupied a local lake-like depression or basin, probably at the close of the great volcanic era during which most of the mountain valleys of central Arizona were filled up by sediments and then overlaid by successive streams of lava. Sedimentary beds of volcanic origin remain throughout the Verde Valley and its chief tributaries, and in the region of Camp Verde are deeply eroded, but rest on the uneven floor of ancient Pre-Silurian slates standing on edge. High above the deposits of the valley, vertical cliffs of hard lava mark the edges of extended mesas of malpais, under which all the other formations are hidden and protected. But the excavations in the banks of the sulphate of soda are insignificant in comparison with the magnitude of the beds, and have failed to show, conclusively, any bottom or top, or to reveal the true relations of the beds to the surrounding formations. Whether or not they are members of the volcanic series or of a later and more local origin is yet uncertain.

Thenardite.—This salt constitutes the bulk of the deposits. It is coarsely crystalline mass, so compact and firm that it can be broken out only by drilling and blasting powder. It varies in its purity. Some portions are more or less contaminated with a greenish-colored clay, but it is obtained also in large masses nearly colorless and transparent, with a slight yellowish tint, but seldom showing crystalline forms.

Mirabilite.—The hydrous sulphate of soda occurs in close association with the thenardite and appears to penetrate its mass in veins, but may prove to be an overlying bed. It is this species which, by its rapid efflorescence when exposed to the air, covers the whole deposit with a white powder and a thick crust through which the quarrymen must cut before they reach the solid banks of the anhydrous sulphate.

Halite.—Rock salt in beautifully transparent masses is sparingly disseminated in portions of the great beds. These crystalline masses, so far as observed, do not exceed an inch or two in thickness and no evidence of the existence of any separate workable beds could be seen. It is irregularly disseminated in the sulphate. Some masses exhibit beautiful blue tints of color, like those seen in the salt of the Tyrol and of Stassfurt. Good fragments for optical and thermal experiments could be obtained here.

Glauberite.—This anhydrous sulphate of lime and soda is an interesting associate of the other species. It occurs chiefly near what appears to be the base of the deposits, in a compact green clay. It is in clear, transparent, colorless crystals, generally in thin rhombs, lozenge-shaped, with the plane angles of 80 and 100 degrees, and from half an inch to an inch or more broad and one-eighth to one-quarter of an inch in thickness. The prismatic planes, 11, are generally nearly obliterated, or are absent, through the great development of the hemi-octahedral planes, 7, replacing the obtuse terminal edges. The terminal plane, 0, is chiefly developed, and this, with the broad planes replacing the obtuse edges, gives to some of the crystals the appearance of rhombohedrons of the minus series. The general habit of the crystals is similar to those from Westeregeln, near Stassfurt, described by Zepharovich; † with the predominating pyramid, —1, occur also the pyramids — $\frac{1}{2}$, — $\frac{1}{3}$, and either — $\frac{1}{4}$ or — $\frac{1}{5}$; traces of a pyramid on the acute edges have also been noted. There is evidence that the crystals vary greatly in size and in their habit in different parts of the deposits. They occur also in the midst of portions of the solid thenardite as inclusions, and in

* American Sci. Jour., XXII, 204, 1881.

† I am indebted to Prof. E. S. Dana for these crystallographic descriptions.

one instance a small crystal was found in the midst of a transparent mass of halite. Close inspection of the transparent tabular crystals from the green clay reveals the presence of crystalline cavities with fluid inclusions made evident by the movement of small bubbles. When heated, the decrepitation is violent.

Carbonate of lime pseudomorphs.—Where the lower bed containing the bulk of the glauberite crops out at the surface and has become oxidized and dried, the glauberite disappears and is replaced by carbonate of lime in an amorphous condition, but having the exact form of the glauberite crystals, whose matrix they have filled. These pseudomorphs are firm, compact, and dense, but are without cleavage or interior crystalline structure. Color, cream yellow. They weather out in great numbers and show that the glauberite must occur in a great variety of sizes and forms of aggregation, in some places in rosettes and in others in crystals two or three inches long.

* BOURNONITE IN ARIZONA.

Bournonite occurs sparingly at the Boggs mine, Big Bug district, Yavapai County, Ariz., associated with pyrite, zinc blende, galenite, and copper pyrites. The crystals are brilliant and characteristic, with interesting modifications not yet studied and compared. This is believed to be the first announcement of the occurrence of this species in the United States. I am indebted to Fred. E. Murray, esq., superintendent of the mine, for specimens.

NATIVE SODIUM CARBONATE.

Extensive deposits of a native sodium carbonate in northern Sonora, near to the Arizona line, are known to exist and are under exploration by citizens of Tucson.

In the month of February, 1898, an investigation of the nature of this material was completed by me in the laboratory of the Arizona School of Mines, and a brief statement of the results was printed in the Engineering and Mining Journal of New York, February 12, 1898. A résumé of this article is appended.

The Arizona School of Mines has recently completed an investigation of the "trona," or crude carbonate of soda, brought in from a deposit near the head of the Gulf of California. It is known as the Santa Helena Soda Deposit, and has been taken up under the mining laws of Mexico by Messrs. Andres and Joseph Rebell, of Tucson, Ariz. The location is in the northernmost portion of the State of Sonora, Mexico, in the mining district of Altar, about 2½ miles from Adair Bay, and directly upon the shore of the Gulf. It is thus not far from the international boundary line, and is most directly accessible by water from Yuma or the Colorado, or overland from Gila Bend station, on the Southern Pacific Railroad. The shores of the eastern side of the Gulf at the place are generally low and shelving, and broad areas are left bare at low tide. At this particular point it is claimed that the water is deep enough for vessels of moderate draft to lie safely at anchor, where they can take in cargoes of soda from lighters.

The soda is found in the central portion of a basin-shaped depression, described as a dry lake, about 1 mile in length and 1 mile in breadth. The soda is spread out in a white sheet or layer over an area of some 60 acres, and resembles a mass of snow and ice or the surface of a frozen lake. The few tests that have been made by digging and boring down into this deposit show that it has a thickness varying from 1 to 3 feet, partly overlaid by a stratum of sandy earth some 3 inches thick. The lowest portions of the soda bed are saturated with water, or rather with a solution of soda in water, and this seems to underlie the bed for a depth of 2 feet. The solution is so strong that when exposed to the air and sun soda rapidly crystallizes out and forms in layers to a depth of nearly 3 inches in less than thirty days.

The valley appears to have several permanent springs of water of small volume, but in the very center of the deposit there is a spring, or water hole, where potable water can be had in quantity. No investigation has yet been made of this spring water, which may, on analysis, be found to contain enough soda in solution to give origin to the great deposit by long continued evaporation. The existence of water fit to drink is a most important advantage in that arid region.

The purity of the sodium carbonate of this deposit is remarkable. It is brought in from there in large mains almost free from sediment or earthy impurities. It may be obtained in clean crystals and crusts by solar evaporation of the concentrated or saturated water from the bottom of the bed, but in digging in the large way there appears to be a notable mixture of insoluble clay and very fine sand, an earthy impurity which probably has been blown in upon the soda lake by the winds from

* Sitzungsber. Akad. Wien, Vol. LXIX, 1874.

the surrounding hills of Colorado River silt, as shown by the analysis of the average sample:

Composition of the average sample.

	Per cent.
Sand, silt, etc., insoluble in water	13.00
Iron oxide and alumina	2.80
Lime	1.14
Salt	4.70
Sulphate of soda	4.70
Carbonate of soda	75.86
Total	100.00

One avoirdupois pound of this sample leached with cold water gave 75 per cent of clean white sodium carbonate, including the small quantity of other soluble salts. Hot water gives a larger product. There appears to be an increase of weight by absorption of water. The weight and bulk of the product by lixiviation is much reduced by ignition, thus driving off a considerable amount of water. It would appear to be desirable to dissolve the trona and to filter or decant to get rid of the insoluble impurities, but this would perhaps remove the product from the free list and subject it to a considerable import duty in the ports of the United States.

Another sample of selected crystals was analyzed by Prof. Robert H. Forbes and Mr. M. H. Walker in the chemical laboratory of the agricultural experiment station of the university. They found the specific gravity to be 2.33. The qualitative examination showed, in addition to the carbonate of soda, a trace of chlorine and sulphates, no sulphides and no lime, barium, or silica, no potassium or ammonia. Some of the sodium was in the form of bicarbonate. The equivalent of 71.96 per cent of NaCo was found by titration with standard HSO.

The owners estimate that this deposit will yield 1,000 pounds of soda to each square yard of area, and that the soda can be dug and put on shipboard for about \$2 per ton. In one test it was found that one man could throw up 4 tons of the soda in one day.

The height of the deposit above mean tide is about 27 feet. The plan is to construct a tramway to the water of an inlet navigable for lighters drawing less than 6 feet of water, by which the mineral can be transferred in bulk to a vessel lying in deep water.

It is proposed to ship this trona to San Francisco, where an important use for it will be found in making borax from the crude tincal, or boracic acid, of Nevada. It has been suggested, also, that the borate of lime (colemanite) of Nevada might be brought to Yuma, and there meet the carbonate of soda and produce borax. There is a scarcity of fuel at this locality, but for purposes of evaporation the ardent rays of the sun and the dry air are satisfactory substitutes.

GYPSUM.

Arizona has enormous deposits of gypsum both in the northern and in the southern counties. The transparent variety in clear sheets is known to the old Spanish residents as "yeso," and has been used in place of glass to admit light, while excluding air, in the walls of adobe houses. In the fibrous form, with a satin-like luster, this mineral occurs sparingly, and is known as satin-spar. But the common and most abundant form or occurrence is the massive and amorphous variety, the massive uncrystallized gypsum, useful as a fertilizing material and for the production of the quick-setting cement known as plaster of paris. The native massive gypsum as quarried out from its beds contains 20 per cent of water of combination, which can be driven off by heat, leaving a white powder which has the property of rapidly taking up and combining with water again so as to set and harden.

At present the uses of gypsum in Arizona are few. It will hardly pay to transport and grind it for a fertilizer, though there is little doubt that it might be used to advantage upon some of the lands. Mr. Mosier, the enterprising builder of Tucson, has made use of the gypsum from the Sierritas Mountains to prepare plaster of paris in quantity at Tucson. This plaster of paris was used by him in finishing the walls of the interior of the new cathedral.

The occurrence of extensive stratified deposits of gypsum in the Santa Rita Mountains, about 25 miles from Tucson, was reported in the report for 1896.

SULPHUR.

The demand for sulphur having notably increased since the beginning of the war with Spain, there have been many inquiries for sources of sulphur in Arizona. The projected establishment also of works for the manufacture of sulphuric acid in Los Angeles has directed attention to any deposits of free-burning iron pyrites of large

extent and near enough to rail or water transportation to avoid any large outlay for its delivery at the works.

Among other sources the banks of sulphur reported to exist at the head of the Gulf of California, and more accessible from Yuma than from any other point, have received special attention. It is stated that these deposits form a series of low hills of various colors, blue, red, green, and black, making the hills conspicuous objects for miles. They rise from the desert near the south boundary of the eastern end of San Diego County, Cal., about 20 miles above the mouth of the Colorado River.

Captain Polhemus, well known upon the Colorado River, left Yuma early in the summer in the steamer *Mohave*, intending to fetch back to Yuma 200 tons of the sulphur for shipment to the works at Ventura, Cal.

COAL IN ARIZONA.

Investigations which I have made show that the rocks of the true carboniferous period have a wide extension and distribution over the Territory, even as far west as Tucson. They are largely developed in the Chiricahua Mountains, and are there accompanied by coal measures, with thick beds of black carbonaceous shale and impure graphitic coal, showing indisputably the former extension of the ancient carboniferous flora far westward of the limits usually assigned to it. Although efforts have been made to find in these carbonaceous graphitic beds some seams of workable coal suitable for fuel, they have not been rewarded with success, and the question whether good coal can be had from these coal measures is still unanswered. There have been small quantities taken out as samples which burn very well and could be claimed as hard anthracite, but most of the coaly mass carries a large amount of ash and burns with difficulty, like the graphitic anthracite of Rhode Island, which it resembles. One bed of this material, about 12 feet, between the roof and floor, is a brilliant-looking anthracitic mass of graphitic shale. It certainly marks the horizon of a basin of ancient carboniferous vegetation of large extent. Similar croppings are reported for miles north and south. The beds are not horizontal, but are strongly uplifted and plicated.

Local intrusions and disturbances may also account for the extreme degree of metamorphism and the conversion of the former coal shale into a graphite anthracite.

These carbonaceous beds are believed to be on the line of the southern extension of the San Carlos coal fields, so called. It is reported that southward, in Mexico, a fair coal is secured from the southern extension of the same mountain range, and that it is used by smiths. Notwithstanding the fact that the outcrops so far opened have not produced coal, I consider it highly probable that at some place upon this coal horizon a good seam or basin may be found. The discovery of good mineral coal is of such importance to the people of the Territory that special explorations of the coal formations should be undertaken.

If reports are true, there are outcrops of good coal north of the Gila, upon the southern part of the San Carlos Indian Reservation.

The existence of true coal measures in the Chiricahuas prepares me to lend credence to these reports. I certainly advise an exploration of this region.

The foregoing, from my report of 1896, serves to introduce a copy of a more formal paper on the subject which I contributed to the pages of the *American Geologist* in June, 1898.

ANTHRACITE COAL IN ARIZONA.*

Beds of graphitic anthracite coal occur in the mountains of the southeastern portion of Arizona. They crop out in considerable magnitude in the Chiricahua range of mountains near the bold summit, known as Cochises Head, south of old Camp Bowie, and about 30 miles from the Southern Pacific Railroad at Teviston. The chief exposures are near Bridger's camp, at the head of Wood Creek. The beds are there in close association with shales, sandstones, limestones, and massive conglomerates, in regular strata, resting upon or against a crystalline gneissic and granitic foundation. The stratified formations are believed to be carboniferous in age, and the coal is presumably a member of the series, but its exact relations stratigraphically have yet to be satisfactorily shown. The sequence of strata appears to be conglomerate, limestone, sandstone (quartzite), black siliceous shale, coal, shales, plutonic dyke, gneiss. The stratified formation attains a thickness of 2,000 feet or more. The limestones are largely developed, and are generally blue and but little changed. They contain encrinurites and here and there brachiopod shells, apparently *Productus*. Other portions of the rock have been altered to white subcrystalline beds. There is an abundance of flint nodules and layers of flint. The strata dip northward at various angles, but generally less than 45 degrees.

* From the *American Geologist*, Vol. XXI, June, 1898.

The coal beds crop out in a ravine. They have not been much explored, and some of the tunnels in which it is claimed that three beds were cut have caved in so as not to be accessible, but the great heaps of slaked coal and black dust at the mouths of such tunnels show that the material was found in quantity. The only accessible opening showed a thickness of glossy black graphitic anthracite over 12 feet in thickness. It reminds one of the hard graphitic anthracite of Rhode Island, but, except in selected specimens, it appears to carry more ash than the Rhode Island samples and to be even less available for fuel. It is hard to ignite. The percentage of ash is large, as will be seen from the following tabulated results of analyses made by me in the laboratory of the Arizona School of Mines:

Analyses of Arizona anthracite.

Number.	Sp. gr.	Ash.	Combustible and water.	Remarks.
1.....	1.49	13.30	86.80	Selected fragments.
2.....	1.73-1.80	30.45	69.55	
3.....	1.76	27.40	72.60	Slaty.
4.....	1.85	30.00	70.00	Do.
5.....		22.04	77.96	Black powder.

No. 1 had red ashes; No. 2, white ash; No. 3, white ash tinged with red; No. 5, red ash. All the beds afford glossy black, lustrous, and shining masses, but generally in curved layers, and having a graphitic luster, except Nos. 1 and 5. No. 5 is taken out of the mine in a fine black powder.

It can not be claimed that any of this material has much value as a fuel. It may be found useful in some metallurgical operations as a deoxidizing agent, or for lining (brasqueing) crucibles and furnaces.

The presence of such large beds of carbonaceous material is significant of a great area of Paleozoic vegetation and of shallow seas and coal-forming basis analogous to those of the coal measures. If, as I confidently expect, further investigations shall show that these graphitic anthracites are metamorphosed coal beds of carboniferous age, our present ideas of the westward extension of the flora of that period will require great modification.

There are many evidences in southern Arizona of shallow seas in Paleozoic time, and of great tidal currents, and of extensive shore lines. Coarse conglomerates of well-rounded pebbles of Paleozoic age abound in the Santa Ritas, in the Santa Catalinas, in the Babioquirari, and other mountain ranges, and in the low hills of Arivaca, south of Tucson, and near the boundary of Mexico.

Quartzites—probably Cambrian—are a striking feature of some of the mountain ranges between Tucson and the gulf coast of Sonora.

PETROLEUM.

There are no springs or outflows of petroleum yet known to exist in Arizona. In December, 1890, the discovery of a variety of petroleum was announced at St. David, in Cochise County. While boring for water at this place a dark substance, having about the consistency of molasses, was found at a depth of 290 feet. This substance, supposedly a variety of rock oil or petroleum, was yellowish in color, and, it is reported, was found to be combustible, but samples have not been received at the School of Mines and nothing more definite than the above can be stated at this time.

Some parties, including Mr. McKay, of Tucson, who were prospecting for coal in the dark-colored shales (coal measures?) of the Santa Ritas east of Rosemont, took out masses of slaty rock which had the odor of petroleum. Samples submitted to me gave evidence of a very small quantity present, for oil could be distilled from it in a tube.

TUNGSTEN.

An important discovery of tungsten ore has been made in the Dragoon Mountains, at Russelsville, about 6 miles north of Dragoon Station, on the Southern Pacific Railroad. This ore is the variety of wolframite known as hubnerite, being a tungstate of manganese. It is valuable for the manufacture of tungsten steel, an alloy which has peculiar properties. Several claims have been located and are now being developed. Several shipments of hand-sorted ore have been made to Philadelphia. The mineral occurs irregularly in the midst of quartz veins traversing granite. Some of these veins are only a few inches wide; others are 2 or 3 feet wide. The

hubnerite rarely extends from one side of a vein to the other; it is generally in isolated patches in the center. It is a remarkably pure article, free from noxious substances, and in much demand.

VI.—MARBLE, ONYX, BUILDING, AND ORNAMENTAL STONE.

MARBLE.

The resources of the Territory in white, black, and mottled marbles are great, but for the present the cost of hauling and transporting by rail to markets preclude the development of the beds except on a moderate scale for local consumption.

The industry of making cemetery monuments has already been established in Tucson. The marble is brought from quarries in the Santa Rita Mountains some 20 miles east of the city. It is chiefly white with blue veins, and it takes a good polish.

Fine-grained black marble of excellent quality has been brought in by Mr. W. B. MacCleary, of Tucson, to the museum of the School of the Mines. The beds are not yet opened, but will no doubt supply good blocks of this desirable marble.

Some remarkably fine white statuary marble, in large masses, was noted by me on the northeastern side of the Santa Catalinas, on Marble Peak. It has not been explored. The grain and texture are excellent.

Fine variegated and brecciated marbles are found cropping out on the slope of the hill at the Total Wreck mine, in the eastern spur of the Santa Ritas. This is easily accessible, and would add greatly to the beauty and variety of any decorative marble work.

No especial search has yet been made for ornamental varieties, and the demand for decorative slabs, panels, and mantels has not yet grown sufficiently in the land of adobe houses to justify great attention to the development of quarries.

ARIZONA ONYX MARBLE.

The increasing production and exportation of the unusually beautiful onyx marble found upon Big Bug Creek, in Yavapai County, deserves special notice. The deposit covers some 200 acres, and has become the property of the Arizona Onyx Company. It is about 26 miles from Prescott, in the vicinity of Mayers Station, on the stage road from Prescott to Phoenix.

Prof. George P. Merrill, of the United States National Museum, says of this stone that "it is traversed parallel with the planes of the deposition by wavy bands of color in all shades of amber, white, ochre yellow, deep ochreous red, and green of a most beautiful emerald shade." He likens this onyx to that of Mexico, which it resembles, but he considers the Arizona stone to be vastly superior to that now sent into our markets from the Mexican quarries.

A deposit on Cave Creek has been opened and worked by Phoenix capital, under an organization known as the Phoenix Onyx Company. The following description has been furnished:

The onyx quarry is located at Cave Creek, 45 miles northeast of Phoenix. Mr. B. Heyman, the owner of the mine, started a plant here last year for the purpose of cutting and polishing the onyx, but through dissatisfaction and incompetency of people employed he concluded to close down until practical, competent onyx men could be found. The mine covers 20 acres on a side hill, and it is found in decomposed limestone, in bowlders varying in size from 2 or 3 to 25 and 30 cubic feet. Large pieces can be found, but not of so fine quality. The onyx is brought to Phoenix in the rough and cut in any form desired by gang saws, the same as used in cutting marble. Then it is placed upon a rubbing bed from 7 to 10 feet in diameter; then taken and honed down, afterwards being put under a polishing machine. Mr. Heyman has shown samples of the onyx taken from his mine to New York dealers who are experts, and all have pronounced it the finest grade of onyx yet produced in this country. The variety of colors are numerous and very beautiful. The onyx used in the counter of the Auditorium annex in Chicago was taken from this mine. There is a very handsome fountain in Mr. Hudson's drug store of this city, also a counter at the Wave confectionery, covered with this onyx. Mr. Heyman has received orders for several carloads squared off for shipping, but on account of the loss in squaring he decided not to ship in that manner.

LITHOGRAPHIC STONE.

A compact amorphous lime rock has been prospected with view to its utilization for lithography. Its value for such purposes depends not only upon the texture and adaptation to absorption of water and faulty ink, but upon the size and homogeneity of the blocks. The results of the trials of the material obtained at Big Bug have not been reported.

CHALCHIHUITL TURQUOISE.

Several localities of this ornamental stone or gem are known in Arizona. The two most important are one in Mohave County and the other in the Dragoon Mountains. At both these places there are ancient, prehistoric excavations made by the aboriginal races in search of the gem known to them as "chalchihuitl." They prized this gem most highly, and it appears to have been known and valued all over the region formerly so thickly occupied by the prehistoric peoples in New Mexico and Arizona and southward in Mexico, even to and perhaps beyond the ancient Aztec capital. Montezuma held the chalchihuitl in high esteem. He showed great favor to the royal home of Spain by sending four chalchihuitl stones as a present through Cortez.

The presence of fragments of this gem, or small ornaments made of it, in ancient ruins and places of sepulture in places widely separated, together with the far distant points at which veins of it were worked, show the universality of the appreciation of the gem. So also the high appreciation in which the gem is held at the present time by the Navajoes, the Zunis, and other tribes of Pueblo Indians shows, or at least indicates, that the Pueblo tribes of to-day are the living representatives of the people who dwelt in cities along the Salt River and Gila valleys.

BUILDING STONE.

Granites, porphyries, sandstones, limestones, marbles, tufas, and other building stones and materials for building abound in Arizona.

The sandstones of Flagstaff and the tufas of Tucson have been utilized. The Flagstaff and other quarries on the line of the Atlantic and Pacific Railroad have supplied red sandstone and freestone of excellent quality and grain for important buildings in Phoenix and elsewhere. The white tufas of Tucson have been used in the construction of the University dormitory and for a private residence with great success. This material is excellent for building purposes. It is easily quarried and cut to dimension blocks. It has no perceptible rift, being homogeneous, and thus chips well in any direction. The fracture is conchoidal. It does not crumble. It is porous, a bad conductor of heat, and is durable and does not discolor.

LIMESTONE CEMENTS.

As with building stones, so with limestones suitable for making lime for mortar—they are abundant and accessible at nearly all points where they are needed. At Tucson good lime is burned in the Tucson Mountains a few miles west of the city.

At Tempe there is a limestone which makes an excellent hydraulic lime mortar. It is believed that abundant deposits of material suitable for the manufacture of hydraulic cement can be found among the many varieties of volcanic ejecta distributed through the mountains. There are remarkable examples of natural cemented breccias and conglomerates in the Bradshaw Mountains and elsewhere.

The caliche, which crops out along the mesas and gravelly deposits, makes a strong mortar when burned and mixed with sand.

SILICIFIED WOOD.

The finest and largest specimens of silicified wood in the known world are obtained at Chalcedony Park, near Holbrook, Apache County, Ariz. Whole trunks of trees and stumps with portions of the roots are found there converted into stone as dense and hard as the finest agate. Every cell and fiber of the former wood is preserved in stone. The specimens are often called "agate wood" and also "petrified wood." A forest of trees appears to have been entombed in the rocks and to have been preserved by a slow process of replacement by silica from solutions permeating the beds. Subsequently the surrounding sediments have been washed away, while the enduring fossilized trees remained.

Tons upon tons of specimens have been taken away from the locality by collectors and dealers. A large quantity was shipped to Sioux Falls, S. Dak., to the large establishment founded there by the Drake Company, James H. Drake, president, for cutting and polishing the granites and porphyries of the Northwest for architectural decorative work. Sections of these trees 4 feet in diameter and large enough for tops of tables were cut and polished. Many specimens were shown at the New Orleans Exposition and at the Paris Exposition in 1889, where they were greatly admired for the perfect preservation of every detail of structure of the wood, for the very high polish, and for the exquisite interblending of colors in the mass, due to the presence of various oxides in the original silicifying solutions.

The silicified woods of this locality in Arizona were first made known to the world through the collection of M. Jules Marcon, the geologist of the thirty-fifth parallel

Whipple's) survey, for a railroad route to the Pacific Ocean. (Vide Volume III of the United States Pacific Railroad Surveys.) The writer had the first specimen cut and polished from this collection in 1855. For a notice of the objects shown in Paris in 1889 reference may be made to the reports of the United States Commissioners (1889), Volume I, page 414.

For this exhibit of Arizona fossil wood, or "agatized wood," the exhibitor, the Drake Company, received a gold medal.

Very interesting specimens of silicified wood occur in quantity upon some of the mesas bordering the Colorado River, especially upon the mesas of the desert west of the Colorado near the Vallecito and San Felipe in California. So, also, silicified fossils may be found upon the same mesas in transported pebbles from the upper country. In several localities fossils, such as shells and corals of ancient Paleozoic time, are completely silicified in the midst of the limestone by which they are inclosed.

VII.—WATER.

Water in Arizona is the mineral of prime importance. Without it industry and life cease. Where it is abundant its value is not appreciated. There are but few localities in the Territory where this statement can apply. There are few or no localities where water is superabundant. Yet there are times and seasons when streams are overflowing and the precious fluid runs to waste. It is the province of the engineer to prevent such waste. Storage reservoirs where the streams are born give the remedy—not one reservoir, but many, and in every canyon and ravine along which the floods roll during the rainy season. A system of small reservoirs will not only save up the water for the dry season, but will go far toward preventing destructive floods.

Another source of water for arid valleys and plains is found in the underground streams. Where there is a constant flow in sight above the surface we rarely take thought of the saturated condition of the gravel, sand, and boulders forming the bed of the valley. In many, and perhaps all, of the dry river beds and great washes which are only now and then filled with water rushing madly down the valley, and after a few hours become dry again, we may confidently look for an underground flow. And, again, another source of water is in the stratification of permeable sediments covered by those which water can not permeate. Such conditions, with a proper source of water, may give water by boring through the impermeable bed into those below which are water bearing, and thus give wells in which water will run to and above the surface, such conditions as were found at Artois, in France, from which we get the name artesian.

There are not many examples of the true artesian-well conditions and flowing wells in Arizona. One at the mouth of the Verde River, in the Salt River, was bored there by a soldier with improvised tools, but he obtained water at a depth of 500 feet. There have been several successful borings of moderate depth in the valley of the San Pedro above Benson, where there are thick beds of red clay under which water flows. A well recently bored by Mr. Gould on his rancho gave a good flow of water from a depth of 300 feet. There are upward of 25 flowing wells in the valley near St. David.

For the purpose of giving a somewhat connected view of the natural and artificial sources of water for Arizona, I have compiled freely the following notes and figures from the reports of the county commissioners:

YUMA COUNTY.

Commissioner of Yuma County writes:

"*Water supply.*—The original source of water supply is comprised in the fall of rain and snow in Arizona and the States and Territories north and northeast of it. Where the fall is greater than the evaporation the water eventually finds its way to rivers and streams that drain the mountain regions by seepage, percolation, and surface flow. It may also be taken from springs and wells fed similarly.

"Water occurs in any portion of the Gila and Colorado valleys at a depth of from 12 to 25 feet, but of course the quantity thus obtained is insufficient for extensive irrigation.

"But, withal, the supply upon which the settlers are forced to place reliance is the inexhaustible volume that during high water passes along the channels of the Gila and Colorado rivers to the sea. The drainage of much of Nevada, Utah, Colorado, and all of Arizona finds lodgment in the Colorado throughout its 1,200 miles of channel. An admirable feature in this connection is the peculiarity of reaching its highest dimensions in the months of June and July, the very time when other streams are low. But it must be said that there is sufficient at all times to irrigate every acre of land tributary to it. The river supply at the season of irrigation is greater than that of all the utilized streams of California combined.

"The Gila at certain annual periods spreads to close upon 2 miles, where the surface contour so permits, with an average depth of 4 feet. In June, July, and August, for 40 miles from its mouth, it is either very low or absolutely dry, although considerable running water can always be found along the bed rock. It happens frequently that where reefs of rock cross the river the water comes to the surface, only to disappear again when the barrier is passed. An excellent site for storing enormous bodies of water has been surveyed by a competent engineer, the location being in the Gila Valley, a few miles east of the county line, in Maricopa County. The hoarding capacity is in every way equal to furnishing irrigation facilities for the entire lower Gila Valley as well as the outlying mesas and higher plains, while the construction will not be attended with unusual difficulties; nor would the cost prove excessive in comparison with the increased value of the lands, large portions of which are now worthless. Such works would effectually obviate the disheartening effects of the sinking of water to bed rock in summer, for the amount saved during high water that would otherwise have gone to waste would furnish the means of livelihood to a large population, as against the present meager number.

"The Colorado and Gila are included among the most prominent streams of the Pacific Coast and afford more than sufficient irrigation capacity for the cultivation of the more than 242,000 square miles of mountainous country, while the latter also drains an immense surface very similar topographically. Thus it can easily be seen that water is superabundant. Whether the Government, with an overflowing Treasury and command over the most advanced engineering skill of the times, will utilize to the best advantage what is placed before it or not, is a question that can be answered only by itself.

TRANSPORTATION.

"An important factor in connection with the early ripening of horticultural, viticultural, and agricultural products is the question of easy and rapid conveyance to prominent market centers east and west. The Southern Pacific Railroad, one of the largest transcontinental lines in America, passing through the city of Yuma, runs through the Gila Valley as far as Adonde, a station some 30 miles east of Yuma. It then passes upon the mesas south of the Gila, the track extending upon an average not more than 5 miles from the river until the county line is reached. Thus is afforded convenient egress from any section of the valley and direct communication from thence to all parts of the United States.

"Other roads have been surveyed along both sides of the river. Construction is already commenced on the direct broad-gauge route from San Diego to Yuma, and will, it is expected, be continued from the latter town to Deming, N. Mex.; but nothing decided or definite can be advanced as to the time of completion.

"The Colorado River, being navigable, affords easy transportation by the largest river steamers northward from Yuma to the Needles, where connection is made with the Atchison, Topeka and Santa Fe, thence on to the Grand Canyon of the Colorado, and southward from Yuma to the Gulf of California.

"*Canals.*—Of the several large irrigation canals operating in Yuma County only a few are completed. The remainder, while only partly finished, are nevertheless in a position to meet the requirements of many acres of bottom and valley lands, with the promise of extending their range of usefulness to many times as much again. Almost all head at some point or other upon the Gila River, and are mostly confined within the environs of the valley bearing the same name. Canal building is of comparatively recent origin in the county. A few years since the fertile valleys were almost literally destitute of human inhabitants, while to-day it is safe to say that every acre of valley land along the line of the canals has been filed upon, not to mention considerable mesa land taken up along the line of their projected extensions.

"The names of the most prominent waterways, together with the length, carrying capacity, estimated cost, and number of acres tributary to each, are given herewith:

Name of canal.	Length.	Capacity.	Estimated cost.	Reclaimable.
	<i>Miles.</i>	<i>Inches.</i>		<i>Acres.</i>
Mohawk	85	11,000	\$150,000	40,000
Redondo	5	400	8,000	1,500
Farmers	13	5,000	15,000	10,000
South Gila	22	8,000	45,000	12,000
Purdy	10	9,000	25,000	7,000
Contreras	7	8,000	9,000	2,000
Saunders	10	5,000	25,000	4,000
Araby	8½	3,500	35,000	2,000
Antelope	7	2,000	10,000	2,500
Toltec	3	30,000	15,000	.....
Total	120½	76,900	337,000	81,000

"In the event of the completion of the above described works in accordance with the original plans of the projectors, the total length would reach 241 miles, reclaiming 267,000 acres of bottom, valley, and mesa land, at an estimated cost of \$1,318,000.

"The 'duty' of water is not constant, but varies according to the locality. The quantity used per acre under the lower Gila Valley canals is rated at about one-third of an inch. It should be explained that but little of the land has been irrigated earlier than three years ago, and being virgin soil requires more water than will be necessary during the coming seasons. For this reason it is fair to assume that the 'duty' per inch will be materially increased.

"It may be stated incidentally that by irrigation the fertilization of land fluctuates according to the nature and quantity of the silty matter deposited upon it by the water; and this, it is estimated, is from 30 to 100 per cent. Both the Gila and the Colorado are especially rich in such matter, and therefore the constant fertilization affected through the operating canals renders any further enrichment of the soil superfluous, useless, and unnecessary.

"*Rivers.*—The Gila River, though second in size to its mighty rival, the Colorado, is destined, for the present at least, to figure far more prominently in the solution of the problem of redeeming and making valuable to the husbandman the immense bodies of hitherto arid and valueless land tributary to it.

"The Gila drains a vast territory. Rising in the western part of New Mexico, it flows in a nearly westerly direction through the entire Territory of Arizona. Its northern and eastern sources are among mountains covered for several months in the year with snows of varying depths, the melting of which, added to the many natural springs emptying into it at different points, form a considerable river long before it passes through Graham County. It enters the Gila Valley some few miles above Florence; thence for nearly 300 miles it winds through the now famous Gila Valley, eventually merging into the larger stream at the village of Yuma. The total length of the river is 650 miles. Before reaching the eastern boundary of Yuma County it is fed by numerous rivers, among the most important being the San Pedro, a stream rising near the line between Sonora, Mexico, and Arizona. Along the course of this tributary the rainfall is, perhaps, greater than elsewhere in Arizona, being estimated at 24 inches yearly.

"Another noble tributary is the Salt River, in itself a large stream, having its head waters in the White Mountains. It enters into the Gila some distance below Phoenix. An important adjunct toward increasing the volume of the Salt River is the heavy rainfall about Prescott, amounting during the last ten years to an average of 15.18 inches annually.

"Other rivers, like the Agua Fria, Hassayampa, and the Santa Cruz, bring down further supplies drained from the heavily timbered mountain regions traversed by them in the north, and from the mountainous regions of the south.

"Thus for the major portion of the year the Gila carries a large stream, more than sufficient, in fact, to irrigate a domain princely in extent. None of the rivers so far touched upon, however, are navigable.

"The Colorado River is formed by the union of the Green and Grand rivers. The former rises in Wyoming, the latter in Colorado. From their juncture the stream takes the name of the Colorado, and, following a generally southerly course, empties into the Gulf of California. The entire length, including tributaries, is over 1,200 miles. It flows during the low-water period at a rate not exceeding 4 miles per hour, although, of course, the speed is very much greater when the river is high. Among its principal feeders are the Rio San Juan, the Colorado-Chiquito, the Bill Williams Fork, and, finally, as already explained, the Gila.

"The Colorado constitutes the entire western boundary of Yuma County, its total length between the Sonora line and the Bill Williams Fork, the latter forming its northern boundary, separating, as it does, the counties of Yuma and Mohave, being about 235 miles. It is navigable for nearly 650 miles from the Gulf of California to the Virgin River by steamers registered and licensed through the customs district of Paso del Norte. The river is capable of affording at all periods an almost incredible amount of water for irrigation purposes, sufficient, in fact, to bring hundreds of square miles of fertile lands on each side of the river under cultivation, besides supporting an enormous population.

"*Lands and soils.*—Within the limits of Yuma County there are large aggregations of Government land. The majority of the most favorably situated in the valleys were the first taken, the early pioneers occupying the tracts nearest the rivers, for the reason that they could be more cheaply irrigated. The mesas are for the most part unoccupied, although they comprise much of the most desirable land, such especially as are adapted to the growth of the citrus and other semitropical fruits. Water can not easily be brought upon them on account of their elevation above the river bed. Canals capable of carrying sufficient water for irrigation would entail comparatively heavy expense, because many miles must necessarily be constructed before the water can be brought to the surface. Such outlay would prove too

expensive for the slender resources of the average settler, and so, as matters stand, they lie idle under the rays of a semitropical sun untouched by the spade and plow. This condition of things, however, can not long continue. Neither physical nor topographical difficulties exist that can not be surmounted by the expenditure of a reasonable amount of capital, and, consequently, it is only a matter of time when the completion of works of this character will be effected by private corporations, or, better still, by the Government.

"It may safely be assumed, in view of what has just been said, that the large bodies of available agricultural land are confined to the valleys of the Gila and Colorado, and also to the comparatively level plains stretching from the Gila River to the Mexican line.

"*The Gila Valley.*—The Gila Valley is by far the most important of the two from an agrarian standpoint. It extends from the Gila Canyon, near the junction of the San Pedro River, westerly to the east bank of the Colorado, a distance slightly exceeding 250 miles. That portion of it situated in the county of Yuma known as the 'Lower Gila Valley' is about 100 miles long by from 2 to 10 mile wide, all of which is susceptible of profitable cultivation. The river from which it takes its name cuts the valley in two. Its watershed extends some 30 miles north and upward of 50 south of its channel, the land from either extreme inclining more or less rapidly toward the stream. The Gila traverses a marvelously fertile country, very great in extent and splendidly adapted to the cultivation of nearly all the products of the temperate and semitropic zones, besides many of the fruits common in the tropics. Nor is this longer a matter of idle speculation, for flourishing ranches in various portions of the valley, drawing water from several important canals, amply demonstrate the magnificent results that will ensue should the water supply be equitably distributed and rendered permanent and adequate through appropriate storage systems.

"The following, taken from that excellent work, the Handbook to Arizona, by R. J. Hinton, alluding to the valley in question, is interesting and accurate:

"This consists of a broad expanse of tillable valley land, sometimes overflowed by the river, which is at times 'mighty uncertain,' and a steep range of volcanic hills coming close to the highways for a dozen miles or so, hot, heavy, sandy. It is hardly fair to say sandy, as it is really a friable, alluvial loam, of grayish hue and loose texture. Several ranches are passed, showing that the Gila bottom is cultivable. With irrigation, every square mile of the Gila Valley is capable of producing prolific crops of grains and semitropical fruits, as well as cotton and sugar in great abundance. The river is able to furnish all the water needed and a good deal more. It would take no very great skill in engineering and not a very large sum of money either to construct reservoirs or lakes in which to receive and store the overflow. There are natural basins or dry lakes into which by simple means the water could be conveyed."

"The lands situated in and about the Gila Valley may conveniently be classified as follows: (1) The bottom or overflowed lands; (2) slightly higher valley lands not subject to overflow; (3) mesas or sloping uplands; (4) high, but comparatively level plains; (5) mountains.

"*The bottom and higher lands.*—The bottom lands, as well as those slightly higher, stretch along either side of the Gila River for varying distances north and south until they meet the more elevated mesas which rise from the valley. The bottoms lie directly along the river and are subject to inundation annually. Immediately following the subsidence of the waters the local Indians were, in former times, accustomed to plant corn, pumpkins, melons, and other vegetables. These sprang into maturity with startling rapidity, rarely failing to yield bountifully without additional irrigation. The custom is occasionally followed by resident farmers to this day with excellent results, although but a single crop can be harvested. These bottoms form, perhaps, 25 per cent of the valley lands, and may without difficulty be secured from further invasion by a system of dikes and levees, if deemed necessary or desirable. The soil throughout the valley is a rich brownish-yellow sandy loam, generous, mellow, and porous, with a depth ranging from 6 to 20 feet, the whole resting upon underlying stratas of gravel and sand that readily carry from the surface such excess of water as might otherwise prove injurious to seeds and growing plants.

"Concerning the geological formation of these lands the following, from the report of the citizens' executive committee, is sufficiently comprehensive:

"There is unmistakable geologic evidence that the entire lower Gila Valley was during some prehistoric period covered with water, constituting, in fact, an enormous lake, the surface rising in places to the upper portions of the outskirting mesas. The soil lying at the bottom was made by the washing and erosion of the surrounding mountains. The soda from the decomposed vegetation, the magnesia and lime from the magnesium-lime formation, and the potash from the decomposing granite rocks were carried with unceasing regularity, year by year, until deposited in the

bottom. Eventually, upon the disappearance of the lake, the rich, fertile alluvium, than which there is none better, was left to reward the efforts of the modern husbandman. But nature, not yet satisfied with her handiwork, directed the accumulation of the detritus washed from the distant mountainous region. As a result the soil is extremely rich in the elements best adapted to thorough fertilization, for it contains a certain amount of organic matter, which on decomposing further enhances its agricultural value. By constant overflow and change of channel the deposits are evenly distributed over considerable areas, the process continuing through centuries. These soils are further enriched by decomposed inorganic contributions, including the sandstones, marls, limestones, shales, etc. Besides the ingredients mentioned, a chemical analysis shows that iron, ammonia, and phosphoric acid enter into its composition in the proportions best adapted to add its fecund qualities. The extremes of temperature are somewhat greater than on the highlands, but there is also more moisture.

"The bottom lands are so easy of cultivation that it is not uncommon, after clearing the surface from brush and stubble, to pass over the ground with an ordinary cultivator a single time, and afterwards sowing to grain and grass. In three or four months large crops are harvested, the soil meanwhile being entirely innocent of the plow. All plants seem to grow rapidly, maturing remarkably early. Indications of ancient ditches are apparent throughout the valley, showing plainly the existence of irrigation works by the ancient Aztecs. Curiously enough, in certain instances, the identical routes of those long extinct people have been followed for considerable distances by their modern successors."

MARICOPA COUNTY.

The commissioner of Maricopa County writes:

"*Reservoir sites.*—In the mountain gorges and along the streams mentioned are to be found many magnificent reservoir sites, some of which are being utilized by private and associated capitalists.

"The construction of storage dams of sufficient capacity to reclaim all the lands, arable and irrigable, of the county would require a large amount of capital. Such enterprises should receive Government aid. A speedy return in money from the sale of these lands under existing Congressional enactments, in the almost immediate increase in the taxable wealth of the country, and the satisfaction to be derived from making it possible to create homesteads of inexhaustible fertility for thousands upon thousands of worthy citizens, where now the coyote and the jack rabbit roam at will, surely ought to be sufficient inducement for lending the comparatively light aid and assistance here alluded to.

"*Irrigation.*—In all farming and kindred occupations in the Salt River Valley, irrigation is wholly depended upon. Great progress is being made in reducing the system to exact scientific treatment.

"During the past year much activity has been going on in enlarging the older canals and the extension of laterals.

"Two new canals of large capacity (which I have added to the list contained in my last annual report) will soon be ready to turn in the 'precious fluid.' Great activity in clearing and otherwise preparing for cultivation the lands under them is in progress. These two great enterprises (Rio Verde and Agua Fria canals) will cover about 350,000 acres of what is known as 'desert' land, a large part of which is now open to entry under the desert and homestead acts of Congress.

"Under these two canals lies largely the great orange, lemon, and semitropical fruit belt of the lovely Paradise Valley (a large body of high mesa land), protected on the north by a high range of mountains, and on the east and southeast by a low range of hills, traversed its entire length by the Rio Verde Canal. Here, under the magic effects of water, the visitor will soon find a paradise in fact as well as in name.

"The Agua Fria Canal begins its course to the west and southwest, where the Rio Verde ends, and along its course lies a vast stretch of country of a very high grade of fertility and productiveness. The following is a list of the twenty canals in the county, eighteen of which are completed and in full operation :

Name of canal.	Flow (miner's inches).	Length (in miles).	
		Main canal.	Laterals.
Highland	6,000	18	80
Mesa (consolidated).....	40,000	7	100
Utah	6,000	3	16
Tempe	20,000	3	51
San Francisco.....	5,000	7	12
Arizona	40,000	60	156
Grand	12,000	25	30
Salt River Valley	6,000	15	20
Maricopa.....	6,000	8	20
Farmers.....	1,500	7	15
St. Johns	1,200	26	15
Buckeye	5,000	40	70
Peoria.....	35,000	6	90
Riverside	1,500	8	15
Noonan	1,500	15	16
Citrus Belt.....	2,000	16	20
Agua Caliente	3,000	15	20
Castle Dome	3,000	.....	23
Agua Fria ¹.....	.....	.....	.....
Rio Verde ¹.....	.....	.....	.....

¹ Under construction.

"Many smaller canals are owned and operated by individuals, covering many thousand acres, but of which at this time I have no accurate information. Roughly estimated, I place the lands under these individual canals at 7,000 acres.

"In this connection I regret to report that the unprecedented floods of last year carried away a large section of the Peoria Canal dam, and that the affairs of the canal company have been further complicated by litigation with the original promoters of this enterprise. It is rumored, however, that a compromise of all disputed rights is being effected, and that the company will immediately replace the broken section of the dam. This canal, when completed, will open to settlement (in the vicinity of Gila Bend) one of the most beautiful sections of the country."

THE CONSOLIDATED CANAL COMPANY.

The capacity of the Consolidated Canal Company's system gives ample irrigation to 110,000 acres of land. The canal which for a part of its course follows the ancient canal dug by the aboriginal race, is being enlarged by means of powerful steam dredges which float upon the water of the canal, it being large enough to accommodate large flat-bottomed boats. At the head of the canal, where the water is taken out of the Salt River, a cut has been made through solid granite and it protected by a strong timber dam with many gates, by which the intake of water can be fully controlled at times of floods and freshets in the river. This work has been carried out under the plans and management of Dr. A. J. Chandler.

One feature of this enterprise, rendered possible by the greatly increased capacity of the canal and the larger volume of water it can carry, is the utilization of the power obtained by dropping the water to the level of the lower ditches. It is employed in part in running centrifugal pumps, where there is a great supply of water below, and in running dynamos for the generation of light for the streets and buildings of Mesa.

YAVAPAI COUNTY.

The commissioner from Yavapai County reports there are three locations for water-storage dams that would cover the greater part of the available land; one at the lower end of Williamson Valley, which had been surveyed and required a canal 20 miles long. Another favorable place for a dam is found on Partridge Creek. The Walnut Grove dam, the pioneer enterprise for storing water, has not yet been replaced. Commissioner Martin states that the stockholders intend to rebuild it in a substantial manner at a cost of some \$350,000. Water so stored up in the Walnut Grove Basin would be available for the conversion of the beautiful piedmont slope of rich soil from Antelope to Wickenburg into a magnificent vineyard and fruit region.

Another site for a dam has been located on Date Creek, within 10 miles of the Congress mine.

NAVAJO COUNTY.

Irrigation.—In the year 1896 there were eighteen irrigation canals in constant use, having a capacity of 4,000 miner's inches, with 45 miles of laterals. Of this number, 7 miles of laterals were constructed during the year ended June 30, 1895. Active preparations are now being made for the construction of 60 miles of canal in the northwestern part of the county, which will reclaim and make fertile 150,000 acres of land at an average cost of less than \$2.50 per acre.

Work is now being pushed on 11 miles of canals, having a capacity of 17,500 inches. Twenty reservoirs can be used for storing the water. As yet no artesian wells have been developed.

PINAL COUNTY.

Casa Grande reservoir.—The reservoir of the Casa Grande Valley Canal Company is the largest in the Territory. It covers a surface of 1,600 acres, with an average depth of 12 feet, and contains about 8,000,000,000 gallons of water. It is situated 15 miles southwest of Florence. A levee of earth has been thrown up across a depression in the plain of 14,000 feet in length, 125 feet in width at the bottom, and 25 feet in width at the top, 2 to 1 slope on each side, and an average height of 25 feet. The waste is regulated by three cast-iron pipes 3 feet in diameter, set in solid masonry, regulated by gates and tower. This reservoir cost \$150,000 and supplies water for 6,000 acres, which has since been increased to 6,520 acres.

PIMA COUNTY.

Irrigation and water.—In Pima County there are 130 miles of irrigation ditches, largely situated in the Santa Cruz, Sonoita, and Rillito valleys. The aggregate cost of building same is estimated at \$150,000. A new ditch, 7 miles in length, was recently taken from the Santa Cruz, north of the town of Tucson, and about 15,000 additional acres will be put under cultivation. The irrigation capacity of all the canals in the county is estimated at 12,000 acres.

Well water can be had in the Santa Cruz and Rillito valleys at a depth of 10 to 25 feet, and on the mesas proper from 40 to 100 feet. There is quite a number of bored wells in the county, ranging in depth from 100 to 800 feet. In one well in the Santa Rosa Valley water was obtained at 680 feet in depth.

There is a continuous underground flow of excellent water under the broad mesa slope extending from Tucson to the Santa Catalinas and the Rillito. The water at the university is obtained from this flow at a depth of 90 feet. A steam pump on the same flow at the lower point, north and west, throws a fine stream of good water to Tucson for the supply of the Southern Pacific Railroad and its employees.

MOHAVE COUNTY.

Water supply.—The irrigation canals of this county are of a purely lateral nature, and are simply built to carry water over small tracts of land. The nature of the streams of the county do not permit of extensive ditches or waterways for the reclamation of mesa lands, but rather the fertile bottom lands lying close to the streams. The Big Sandy Valley contains about 10 miles of main canal, and fully 25 miles of laterals. On the Colorado River, above Fort Mohave, fully 250,000 acres of land can be irrigated by means of water wheels and the other crude appliances in use in the Indies and Egypt.

The Colorado River along the western and northern border of this county affords a permanent water supply.

COCHISE COUNTY.

Artesian water and reservoirs.—At St. David, a thriving agricultural settlement, eleven artesian wells are steadily flowing, irrigating an extensive acreage. The deepest well is 275 feet, and the flow has not diminished since water was first encountered. The loss from evaporation is very slight.

Cochise County has the honor of having the only developed artesian wells in the Territory.

There are several points in the county where storage reservoir sites could be built to advantage and with a comparatively small outlay.

GRAHAM COUNTY.

Commissioner Kelley in 1896 reported:

"Canals.—The principal canals in Gila Valley, in Graham County, are the San

Jose, Montezuma, Union, Central, and Oregon, though there are a great many smaller ones, under all of which agriculture is making good progress, and the farmers gradually making good and prosperous homes.

"The following is a list of canals and ditches, their length, and the number of acres of land lying under them:

Canals and ditches.	Length.	Land supplied.	Canals and ditches.	Length.	Land supplied.
	Miles.	Acres.		Miles.	Acres.
Brown Ditch	1½	500	Oregon Canal	7	2,500
Sanchez Ditch	4	500	Mathews Canal	5	2,000
Fourness Ditch	2	480	Curtis Canal	6	2,000
Mejia Ditch	4½	600	Kempton Canal	4	800
San Jose Canal	7	3,000	Maxey Canal	11	5,000
Michelena Ditch	4	600	Fort Thomas Canal	2½	1,500
Montezuma Canal	9½	4,000	Thompson Ditch	3	800
Union Canal	11	4,500	Duncan canals	7	2,500
Sunflower Canal	3	600			
Graham Canal	5	2,000	Total	106	37,600
Central Canal	9	4,000			

"The Montezuma and Union canals are the largest, and are about 12 feet wide on the bottom. These canals are all owned by farmers, who own the lands under them. The owners usually incorporate themselves in stock companies, as they find it much easier to manage their affairs that way.

"The cost of maintaining the canals varies according to the amount of flood waters coming down from the mountains, but the cost of water to those owning rights in the canals will not exceed 75 cents per acre in any year, and the average is less than 40 cents per acre.

"Under the system of irrigation operated by the farmers of Graham County, they are required to pay very little cash for their water supply, as about three-fourths of the charges for maintaining the canals is paid in labor."

RESERVOIR SITES.

In regard to available reservoir sites for the storage of water in Arizona, Governor Franklin, in 1896, wrote as follows:*

"There are many splendid reservoir sites throughout the Territory, and they should be secured to the people by proper legislation, and not allowed to be seized upon for private speculative purposes. One of these sites, at the Box Canyon, on Salt River, would, if properly developed by capital, be of sufficient capacity to reclaim every acre of irrigable land of the public domain in the valley, amounting to millions of acres. On the Gila River, 12 miles above Florence, at what is known as the Buttes, is situated one of the finest natural reservoir sites to be found anywhere in the arid regions of the West. This site has been thoroughly surveyed and reported upon by Lieutenant Glassford, topographical engineer, United States Army, to the Senate Committee on Arid Lands. Five hundred thousand acres of the finest land in the world could be reclaimed by the erection of a dam at this point.

"Lieutenant Glassford says as follows:

"The canals taken from the Gila in the vicinity of Florence cover about 300,000 acres of land, including 50,000 acres on the Pima Indian Reservation. These canals nearly exhaust the water at ordinary stage, although they furnish a superabundance of water in the spring of the year in crop season, and also when the summer rains come early on the Upper Gila, to make a second crop; but there occur usually two short periods in each year when there is a scarcity of water in all the lower valley—say from three to six weeks in June and July, and again about the same length of time in November and December. Especially during the latter period is the amount needed usually limited.

"When the water in the Upper Gila gets low, immediately after it passes through the gorge at the Buttes, where the bed rock comes to the surface, it largely disappears in the gravel bed that underlies the plains in the lower valley. Canals that are taken out immediately below the Buttes have a steady and constant supply of water, while those lower down get none in low water, except at a few places where the bed rock comes to the surface. Notwithstanding this, the entire volume of the river might be turned down to the lower sections if it were possible to raise the level of the water sufficiently through the agency of a reservoir. The many thousands of acres of the most valuable land in these lower plains, before noted, can be successfully brought under cultivation at a comparatively small cost to each acre by

* Report for 1896, p. 65.

constructing a dam on the Gila River at the place above mentioned at the Buttes, some 10 miles above Florence.

"A dam constructed there would store a sufficient quantity of water when the river is flush in the two rainy seasons to insure a steady flow of water in all the canals now in use in this valley and allow a sufficient surplus of water to guarantee the construction of another canal to be taken out of the river at the Buttes on the south side of the river. The capacity of this canal can be as great as all other canals, and would water some of the finest land ever looked upon. This statement may seem an extravagant one, but upon examination of the accompanying map (see the commissioner's report of Pinal County), showing the topography of the country above Florence, at and above the Buttes, it is readily seen that an enormous basin of water can be formed by constructing a dam at that place. It appears that a dam 150 feet high will back the water about 20 miles, giving probably an average depth of some 75 feet for the entire distance. The canyon of the river immediately above the Buttes widens out, and at a distance of one-fourth of a mile it is as much as one-half mile wide on the bottom, and much of the entire distance it is a mile or more wide. The sides of the mountain surrounding this basin are broken by side or lateral canyons that add greatly to the capacity of the basin. The conception of the capacity of such a reservoir can only be appreciated by the engineer and by a study of such spaces. No cross sections of this basin have ever been made, so far as known, to calculate the vast volume of the basin, but the above statement is not overdrawn, and it is believed that an accurate survey will increase this estimate. There can be no doubt of the water supply being sufficient to fill this vast reservoir when a dam is once constructed, as a glance at the rainfall data in the watershed covering southwestern Arizona and a large part of western New Mexico and Sonora will prove. It is believed this watershed will not only furnish water for this ideal reservoir, but will also supply many other reservoirs, smaller in capacity, that can be constructed at different places in the Lower Gila River Valley, and from which many thousands of acres of valuable land can be reclaimed.

"The above facts seem to me so patent that it is respectfully urged that this place be investigated for early experiment and surveys in Arizona, under the Government, as there are few spots in the United States, and certainly few in Arizona, where so much can be accomplished with so small an expenditure of means. Indeed, to the person who has looked at the place with the object in view, it appears as if nature has largely made this extraordinary place for the purpose.

"A dam about 200 feet wide at the bottom and 100 feet high, though the height might be doubled, will, it is believed, accomplish the result heretofore outlined. At this place the best rock, almost in place, can be quarried for constructing the dam, and in the immediate vicinity good hydraulic lime can be burned, as is now done by the Mexicans, for use by the cattlemen for the purpose of constructing water tanks. With all these advantages, and many others not enumerated that will be found to exist when properly examined, the Government can not too early turn its attention to this extraordinary place, that it may be utilized while it is yet unencumbered by settlers or other claims, so that this, if the first experiment in the storage of water from large streams, may be a success beyond a question.

"Some action in this direction by the Government is essential, as the work is of such magnitude that it deters private capital from undertaking it until prominent engineers have pronounced the proposition feasible beyond a doubt."

PROBABILITY OF ARTESIAN WATER EAST OF MESA.

At the request of a committee of citizens of Mesa, I made an investigation of the geological conditions bearing upon the question of the probability of obtaining water by boring upon the higher slopes of the mesa or sloping plain lying between the Salt River and the Gila, east of the region now covered by the water from the present canals, including the great Consolidated Canal.

In the Salt and Gila valleys the typical ideal artesian conditions can not be said to exist, even if stratified formations like those essential to artesian water were to be found on the flanks of the mountains on both sides of the great valley (as they are not). The essential abundant precipitation of water on the higher summit, by which the strata would receive a supply of water under pressure, does not exist. The valley is not bordered right and left by snowclad mountains. It may be said that a water supply of this nature is much farther removed. It certainly is, and is found at the sources of both the Gila and the Salt, but this supply is so far to the eastward and on the other side of ranges of mountains with stratified formations generally dipping eastward or away from the westward slope that it can not be assumed to flow continuously through the strata to the Gila Valley; hence, we do not have the stratiform conditions essential to a true artesian flow.

But we do have other conditions which, if understood, may give us a water supply. We have two great rivers, the Gila and the Salt, but they are only residual streams, representative of the former mighty flow of water from the watershed of eastern

Arizona westward toward the Pacific. This ancient stream or flood of water had many times the volume and the transporting power of its modern representatives. It carved and cut its way across the mountains, eroding, deepening its channels, and depositing the detritus in greatest volume where the waters spread out over what is now the broad valley of the Gila and the Salt. Similarly, the Verde, the San Pedro, the Santa Cruz, Queen Creek, and minor streams cut and filled their valleys. These valleys, or troughs, now below the surface, are all confluent and connected. The ancient shores and bounding rocky regions of the former channels now lie deeply buried from view; how deeply buried no one has yet determined by any boring. It remains to be ascertained, but the bottom of the great troughs of the Gila and Salt River valleys, in the region of Mesa or Phoenix, may be thousands of feet below the surface.

According to the law of deposition of materials carried by streams, the size of the detritus depends upon the velocity of the current; hence, with a variable current such as we find in periodic floods, we have had a succession of layers filling these valleys, differing in coarseness and fineness—a layer of pebbles, for example, succeeded and covered by layers of fine silt or even fine clay, and toward the bottom of the trough in which the stream was formerly confined, where the current was stronger and swifter, and its transporting power greater than when at higher levels, the materials laid down were of necessity coarser and boulder-like and more open to the access of water and to its underground flow.

In all the arid regions where streams are intermittent in flow and only appear at the surface during periods of great flood they leave behind them broad, sandy washes, underlain by coarser materials, gravel, pebbles, and boulders. In such deposits and channels we find, as a rule, that water may be obtained by simply digging wells in the channel, and in many cases where water disappears in one part of such stream, leaving a dry bed or wash for miles by some inequality of the rock bed, the water may be thrown to the surface at a lower point and again flow for a short distance freely and again sink and disappear from sight. The Mohave River in California is a good example. The Plomo wash in Sonora is a fine example of a continuous flow, extending probably to the very shores of the Gulf. Many other examples in Arizona may be cited. There is an underground flow in the Santa Cruz, extending, no doubt, to the Gila. There is a strong underground flow under the mesa upon which the university is built, the sources of which are to be found in the Rillito at Pantano and in the Sabina canyon supply.

In such river channels as the Salt and Gila, now filled full, leaving one continuous plain, but nevertheless having trough-like depressions, I conceive we have to a great degree the conditions favorable to confined water. I conceive that the filling of these troughs may be saturated with water from points far removed to the eastward. I imagine that the lower portions of the filling of these great river troughs or channels are filled with water, just as the upper layers of the soil and gravel about Tempe are now filled full with irrigating water. It is well known that the level of the water below the surface at Phoenix has been constantly rising since irrigation commenced. The gravels and sands of the valley, where supplied with water, become in a measure storage reservoirs which when filled will make their saturation apparent by bursting out of springs or by marshy land as is observed to-day. So I conceive a constant supply of water toward the sources of the two rivers may fill to a great extent the subterranean gravels, and that if these gravels are pierced by borings we may have at least an upward flow of water, if not a flow coming to and above the surface. These conditions are very different from true artesian conditions, but may, under favoring circumstances, give a flow above the surface like that from a true artesian well; or if such an upward flow is not secured owing to want of sufficient hydrostatic pressure, it is probable that in the majority of cases water will rise in the boring above the level at which the water is first pierced.

In the great trough of the Gila it appears to me probable that, considering the great thickness of the sediments, from the fine silt of the upper parts of the plain down through successive layers of sand, gravel, and boulders, all laid down and distributed in linear patches and on a slope with the valley, we should have successful wells at almost any point within the main axis or general line of the drainage. How deep such borings should be it is impossible to state. As a rule I should say that the deeper the boring and the coarser the materials reached below the greater the probability of a strong flow of water. The deeper layers of gravel may be supposed to receive their supply of water from points far up the valley. In other words, we may believe that deep-seated deposits of gravel lying upon the general slope of the river, or at a steeper angle, will come to the surface eastwardly at some remote point, the distance depending upon the depth at which these layers are encountered.

The conditions are such that I can only advise experimental work, giving it as my opinion that deeply bored wells will obtain water, and water which, if it does not flow out at the surface, will rise to within accessible distance from the surface.

ANNUAL RAINFALL.

The annual rainfall in Arizona has been investigated by the Phoenix Herald, which gave, not long since, an interesting table of figures compiled from the records of the various Signal Service offices in the Territory, as follows:

Station.	Years observed.	Average yearly fall.	Station.	Years observed.	Average yearly fall.
		<i>Inches.</i>			<i>Inches.</i>
Yuma.....	15	3.06	Fort Bowie.....	22	15.41
Prescott.....	25	18.06	Benson.....	10	8.06
Wilcox.....	10	11.35	Fort Apache.....	14	21.04
Wickenburg.....	10	9.85	Florence.....	15	9.45
Willow Springs.....	2	21.88	Phoenix.....	14	7.38
Fort Verde.....	21	13.13	Camp McPherson.....	4	24.74
Tucson.....	15	12.11	Fort Mohave.....	31	6.00
Fort Thomas.....	10	11.84	Fort Huachuca.....	3	16.60
San Carlos.....	9	13.46	Fort Defiance.....	13	14.19
Pantano.....	10	12.29	Camp Goodwin.....	5	25.57
Fort McDowell.....	24	10.38	Date Creek.....	7	14.23
Fort Lowell.....	23	12.37	Fort Hualapai.....	5	16.62
Fort Grant.....	17	16.85			

The average number of years of observation for each point is about thirteen, and the average annual rainfall about 14 inches. Arizona's entire area in acres is 72,332,800. Of this acreage not much over one-third is susceptible of being irrigated or needs to be irrigated, and of this there is now about 6,000,000 under canal, and a total of about 9,000,000 acres of irrigable lands are claimed, according to land-office statistics. These figures are in round numbers and approximately correct.

The annual water to be depended upon per acre in Arizona for irrigation purposes in the irrigation regions is therefore about 42 inches, less loss from evaporation, etc., of one-third, or 14 inches, leaving a net water supply of 28 inches per acre per annum for the irrigable regions.

These figures differ slightly from those given by Powell in his Report on Lands of the Arid Region (p. 56). He gives the precipitation at Fort Defiance as 14.21 inches; at Camp Bowie, 14.26; at Camp Grant, 15.08; Camp McDowell, 11.45; Camp Verde, 10.85; Camp Whipple, 19.28; Camp Mohave, 4.65 inches.

Attention should be directed in this connection to the fact that the precipitation of rain and snow is vastly greater upon the tops and slopes of the mountains than upon the plains and valleys. Residents of Arizona and of Sonora are familiar with the fact that at the beginning of the rainy seasons, and in fact at the beginning of storms, rain clouds form first and rain descends on the mountains and ridges before it reaches the valleys. It follows that observations in the more habitable and lower regions away from the high ridges can not fairly represent the volume of precipitation over the Territory. It frequently storms heavily in the mountains, while the surrounding valleys are bathed in sunshine.

VIII.—GEOLOGICAL NOTES.

It is obvious that in such a broad and comparatively unknown field geologically as the Territory of Arizona it is not possible at the present time to present a general connected view of its geology. Years of faithful labor and the correlation of the results of many workers are essential to this. The Territorial geologist, without pay and without assistance, can not hope to do more than to give from time to time the results of such local special investigations as circumstances permit him to make, or as he has been able to record in his note books since he first set foot, in 1853, in what is now a part of the Territory of Arizona. Such contributions, though disconnected and by themselves of little value, may assume importance by aggregation, as each bit of tessera in a mosaic is essential to the completion of the whole.

The work of other laborers in this field can not be forgotten or slighted. We are not unmindful of the explorations of Powell, Dutton, Newberry, and Marcon, and of other contributions to our knowledge of the geology of the Territory. The greater portion of the contributions made by official governmental surveys relates to the region in the northern portion of the Territory contiguous to the Grand Canyon of the Colorado. Publications relating to the geology of the central and southern part of the Territory are few in number. Blandy has written a paper with a map of the mining region about Prescott,* but the field of middle and southern Arizona is comparatively new and unknown.

* Transactions Amer. Inst. Mining Eng., XI, 286, 1883.

BRADSHAW MOUNTAINS.

The great central mountain mass of Arizona, generally known as the Bradshaws, includes many subdivisions known as Granite Mountains, Weavers Mountains, Kendrick Mountains, and Wickenburg Mountains, as shown on the latest Government maps. The topography there given is largely according to the best fancy and skill of the topographical draftsman in the absence of any good field work.

The area is wide and diversified, but it may be said that the rocks are chiefly crystalline and very ancient, representing the Archæan, Laurentian, and Huronian. There are large areas of compact homogeneous granite much of which seems to be intrusive. There are ancient gneissic rocks of varying degrees of metamorphism, of compression and folding, such as those above the Walnut Grove dam and in the ridges above toward Minnehaha Flat. Granite abounds around Prescott. It crops in fine gray masses at the Tiger mine. It is there fine-grained, with small, even-sized crystals of black biotite mica and some sphene. It weathers into large boulders of disintegration.

Just beyond the Tiger vein, which is near the contact, this granite is succeeded by slates, sandy and siliceous, with traces of pebbly beds forming a part of an extensive development of distinctly sedimentary rocks which form great hills and extend over eastwardly to and beyond Humbug Creek, the tributary of the Agua Fria, and noted in the mining annals of Arizona for its rich gold placers, which, no doubt, were fed from the many gold-bearing veins which traverse these slates. This is a slate formation which is extensively developed in Arizona. Lithologically it is like the Berkshire, Massachusetts, Taconic slates, and I have called them the Arizonean slates.

VULTURE TO WICKENBURG.

The vein at the Vulture is in ancient slates and gneissic rocks, probably more ancient than the slates at Cave Creek.

From these outcrops we rise upon the undulating surface of low hills of volcanic origin or outflow, generally soft and amygdaloidal, of local extent, having been cut through by long erosion to the bed rock of slate. In places the argillaceous slates pass into dark-colored hornblendic slates, becoming compact, gneissic, and syenitic, and all much seamed and ribbed with dikes of feldspathic or granitic rock, and with porphyritic dikes to the summit, about halfway, and thence upon granite to the Hassayampa.

Passing up the Hassayampa, above Grant's store and the old Vulture mill, there is a bluff of comparatively modern lava, which flowed out over the terrace of river gravel and has protected it from washing away.

From near this place the long, regular slope extends upward to the base of the mountains, about 6 miles. It is covered with grasses and cactacea, but very few or no trees nor shrubs of great size. The soil appears to be exceedingly rich and fertile whenever water is put upon it, and to be composed largely of volcanic mud and ashes or the débris and silt from the decomposition of lavas and trefaceous deposits. This soil and slope appear to be most admirably adapted to viticulture, and would no doubt produce grapes from which a most superior grade and variety of wine could be made.

This slope and soil extend to the mountains at Antelope and beyond. Barney Martin's old place is near to the base of Rich Hill, sometimes called Weaver Mountain. The side next to Martin's is composed of a fine-grained white granite, with a large amount of quartz in it, and black mica. It is gneissic, in regular layers, and appears like a highly altered old sandstone. The bedding pitches northerly at a low angle—about 30 to 35 degrees. It may be called a granulitic granite. It appears to form the lower part of the mountain, the upper portion having a darker and brown color.

West of Antelope (or Martin's) the slate formation crops out, and as at other places is marked by a white quartz vein dipping northward and resembling the quartz lode known as the Leviathan, of which it is supposed to be a part, separated by some great fault, heave, or displacement. This quartz seems quite barren and worthless for gold mining, though there may be rich pockets of coarse gold.

Granite crops out west of the Leviathan lode hill. It is a granular gray granite of coarse texture and has some isolated crystals of feldspar. The Marcus gold vein traverses this rock in an east and west direction, and the granite is much altered and decomposed along its course.

RICH HILL TO WALNUT GROVE.

From Antelope, or Stanton, the road northward to the Hassayampa at Walnut Grove passes over granite, passing into gneissic rock. Much of the granite is compact, gray, and a homogeneous rock, weathering into great rounded masses, like that seen north of Phoenix, at Tombstone, and other places. The rock is especially well

developed and marked by such boulder-like formation at Peeple's Valley, where extremely picturesque avenues are formed by the linear outcrops of Cyclopean blocks, between which there is an abundant growth of the evergreen oak. Similar conditions are found at and near Russellville, north of Dragoon Station.

After passing the summit and approaching the Hassayampa Valley the granite becomes more gneissic, with a large amount of epidote and dikes or veins of granite traversing it.

COTTONWOOD CREEK.

A deep gorge-like canyon is bordered by volcanic sediments, the beginning of the extensive formation of this nature which occupies a large part of the Walnut Grove Basin, or area, above the great Hassayampa Canyon. The left bank of this creek is a bluff of the upturned beds of basaltic lava, alternating with volcanic sediments. A portion of the creek runs in the midst of such sediments, which are largely formed of pebbles and fragments of plutonic rocks firmly cemented together by a gray cement, making a rock as hard as any artificial concrete.

THE DAM SITE AT WALNUT GROVE.

The rocks at the head of the canyon of the Hassayampa, where the dam was located, are granitic and gneissic. They are very firm and compact, and are evidently metamorphic. The planes of structure or ancient sedimentation are well developed, giving the rock a tabular form, well suited to rough construction. The portion of rock pierced by the tunnel for the pipe outlet of the dam was excessively hard, being formed largely of vitreous quartz, probably the altered form of an ancient sandstone, but without the preservation of its former granular condition.

The rocks a short distance north are much more marked in their ancient sedimentary character, though now highly crystalline.

AGUA FRIA AND CAVE CREEK.

The foothills of the mountains north and northwest of Phoenix are formed largely of an ancient, regularly stratified slate, resting at an angle of about 40 degrees upon granite and dipping to the northeast. On the road to Cave Creek both granite and slates are crossed, the granite generally forming lower hills than the slates. The bed rock at the Phoenix mine on Cave Creek is slate.

At the Chataqua and Yellow Jacket claims, about 3 miles west, there are large hills of slate overlying granite at about the same angle as farther east.

SUPERSTITION MOUNTAINS.

This mountain range, lying in Pinal County, east of Mesa and Phoenix, is represented upon the United States map as a continuous elevation from the Salt River on the north to the Tortilla Mountains at the Gila River on the south, cut through only by Queen Creek canyon and wash. The range, if it may be so called, is on the contrary broken and has a wide open valley or basin east of Mesa, a valley parallel with the course of Salt River, and which probably once was the course of a stream like the Salt River, but is now dry. The evidences are considerable deposits on the slopes of the hills of washed boulders and gravel rounded and smoothed precisely as we find the gravel along the rivers, and this transported gravel is made up of fragments from remote ridges and mountains to the west and north. There was once a considerable flow through this valley from that direction, before the Salt River had cut a lower and deeper channel where it now flows.

The name Superstition Mountains should be applied to the ridge between this ancient valley or basin and the canyon of Queen Creek. It would then indicate the ridge seen on the north of the road from Phoenix and Mesa westward to Pinal and Silver King.

The floor of the basin and of the upper portion of the slope extending west from Mesa is formed of a coarse-grained porphyritic granite which weathers away rapidly and thus does not rise in sharp and high peaks. It is very similar to the softer portions of the granite at Oracle and the northern end of the Santa Catalina range, and it is probably the prolongation of the same formation. It extends to the Salt River at the Verde, and is the rock over which the river flows at that point, and through a spur of which the great Consolidated Canal is cut at the head. This rock thus appears to have a great extension northwest and southeast, and without rising into high ridges forms a floor or foundation upon which other and higher mountains are built. The Superstition Mountains, for example, are made up of plutonic lava flows and sediments from volcanic sources. So also the ridges which border the Salt River on the south and form the northern rim of the basin before described are

made up of volcanic sediments in regular strata looking like ordinary sandstones. The color is gray and the bedding is uplifted and the outcrops are broken, angular, and picturesque. Bull Dog Head is an example.

The granite rock in the basin is much decomposed near the surface and is cut by dikes of plutonic rock. There are also quartz seams and veins bearing gold. In many places gold occurs in paying quantity, seemingly without any defined vein, the granite being much softened by the decomposition of iron pyrites, by which the rock is made rusty and red. This decomposition appears greatest at and near the contacts of the granite with the plutonic dikes. (For a further notice of the auriferous deposits, see under the heading of "Gold.") The presence of reefs of limestone strata caught in the interrupted granite may be seen in connection with some of the veins.

BOS ARIZONICA (FOSSIL BOVINE).

A box full of fragments of bones sent to the museum of the School of Mines for identification by Mr. P. J. Coyne and Thomas Deering, on being put together proved to be the horn cores of a gigantic prehistoric bovine quadruped for which the name *Bos Arizona* is proposed. This find was dug by the gold placer miners from the gravel deposits at Greaterville on the eastern side of the Santa Rita Mountains, in Pima County, some 40 miles from Tucson. Unfortunately the bones of the skull were too much broken up to permit of restoration, so it is not possible to gain any satisfactory knowledge of its dimensions and generic characters.

The horn cores, however, show that the animal must have had a huge head and neck, so as to support and make use of horns of such great weight as the dimensions indicate. These dimensions are: Circumference of the largest end, near the base, where the horn joined the skull, 17½ inches; of the smaller end, 12 inches from the base, 13 inches; length of the portion restored, 17 inches; probable extreme length if complete, 23 to 24 inches. It is not much curved. The form is nearly cylindrical in section and is conoidal, but at least twice as large as the largest sized horn cores of our domestic bulls. The form of the horn it would appear must have closely resembled the form familiar to us with the bulls of the Hereford breed, rather than those of the Durham shorthorn or the more elongated and crooked horns of the Holsteins. The form differs decidedly from any buffalo horn known. It does not resemble the horn of the East Indian buffalo.

Somewhat similar fossil horn cores have been found in Texas, in Ohio, at Big Bone Lick, Kentucky, and in Nebraska. And there is a resemblance in size at least to the great horn cores found in Europe, which belonged to the recently extinct *Bos Urs* or *primi-genius*. The affiliations of this species, once so abundant, with the American species have not yet been sufficiently studied, but Dr. Leidy thought that the American species were different from the European. He has described one of the fossils with horn cores 20 inches in circumference as *Bison latifrons*. Prof. O. C. Marsh has described two other species, based upon fossil horn cores from Nebraska as *Bison ferox* and *Bison Alleni*. By the courtesy of Professor Marsh I was permitted to critically examine those fossils in the Peabody Museum at Yale University, and to compare them with the fossil from Greaterville, Ariz. This last is thicker than the Nebraska specimens in proportion to its length and is less curved. A full notice of *B. Arizona* has been sent to the American Geologist for publication.

MASTODON REMAINS IN ARIZONA.

Two molar teeth of the mastodon were dug from the deep vegetable mold of the borders of the great spring at Andrade ranch, on the western slope of the Santa Rita Mountains, in Pima County, Ariz., about 20 miles east of Tucson. These teeth, weighing 4 pounds each, are in an excellent state of preservation and do not appear to have very great antiquity, though ages must have passed since the animal which bore them was mired in the soft mud of this spring. The length of these teeth is 6½ inches. The roots are about the same length. The anterior fangs are separate from the others, and are much curved backward, and in one specimen are twisted one across the other. An enamel-like coating of a dark-brown color covers the whole of the roots, and when this coating is dry it easily breaks or scales off and shows a very clean white dentine below. The roots are also distinctly annulated, the annulations being about one-fourth of an inch wide.

The animal was advanced in years, for the crowns of the molars are worn down so much that the cone-like cusps, so characteristic of the dentition of the mastodon, are gone, and instead of them the dentine or ivory has a cup-shaped surface surrounded by ridges of the thick and hard enamel.

The mastodon from whose jaws these teeth came must have been over 10 feet high and perhaps 20 feet long. The discovery of these remains is important and interesting, showing that these great herbivorous animals once roamed over our valleys. They were great feeders, and there must have been a much more abundant

growth of vegetation when they lived than now exists, and therefore a much larger water supply—another link in the chain of evidence of the gradual desiccation of the earth's surface and the much smaller rainfall and stream volume than formerly.

Two more finds of similar teeth have been reported, one near Bowie and another west of Tucson toward the Quijotoas, but have not been sufficiently verified.

FOSSIL CORALS.

The great mass of the Santa Catalina Mountains is made up of granitic and gneissic rocks of Archean age; but on the northeastern slope, near to the American Flag mine, in the Old Hat district, there are extended outcrops of ancient Paleozoic strata dipping toward the east. In addition to basal conglomerates, made up of thoroughly rounded bowlders and pebbles, there is a thick series of red sandstones, shales, and quartzites, succeeded above by earthy and shaly limestones, in the midst of which there is a stratum of well-preserved corals, among which a branching form is much like a coral found on the Verde River and referred by Professor Meek to the Desonian.*

THE NATURAL BRIDGE OF ARIZONA.

The remarkable natural formation of a chasm spanned by a rock bridge is one of the wonders of the world, and it far exceeds the natural bridge of Virginia in extent and grandeur. This bridge spans Pine Creek, one of the tributaries of the Upper Verde River, in Gila County, in the extreme northwest corner of Tonto Basin, and about 4 miles from the town of Pine.

A description of this natural bridge was given by Patrick Hamilton in his book upon Arizona, with a full-page lithographic illustration (p. 136); but I subjoin a more recent description, giving an account of a visit to the bridge by Mr. Harry G. Logan, one of the students of the University of Arizona:

"Pine Creek at the bridge flows in a canyon with steep sides. Arriving at the brink of this canyon, we see before and below us a nearly level flat of land some five or six acres in extent, reaching across the canyon to the opposite side, where there is an abrupt wall of rocks, the face of a mountain, perhaps 1,500 feet high. Standing on this level tract of land, on which there are buildings, an alfalfa field, and an orchard, it is hard to believe that we are on the top of a natural bridge across a chasm and that the stream flows below us; but, looking to the right and to the left, as we face the precipitous bluff, we see the open canyon, perhaps 300 or 400 feet wide and 250 feet deep. The height of the bridge lessens as we approach the opposite side, and at one place there is a hole in the apparently solid rock through which one can look down for 125 feet to the bottom of the canyon.

"Desiring to get under this wonderful bridge, we take a trail to the left and note that the rocks lie in great benches, or strata, like cave-like openings extending backward into the buttresses of the bridge. Entering one of these openings and crawling sometimes upon our hands and knees, we find a cave, or vaulted chamber, with beautiful translucent stalactites pendent from the ceiling and reaching nearly to the floor. These stalactites are resonant when struck, giving off musical notes. This cave is the abode of numerous bats, and they made it uncomfortable for us to remain, so we descended to the bottom of the canyon, where there is a pool of water 20 to 30 feet across and said to be over 50 feet deep.

"The opposite buttress or wall of the bridge is nearly perpendicular.

"Other caves along the canyon give evidence of the flow of water carrying lime in solution, for twigs, grass, and other substances lying in the water are now covered with a crust or deposit of lime. The rocks of the canyon appear to be chiefly limestone.

"Theorizing upon the origin of the bridge, we may suppose that the springs and streams of calcareous water have gradually deposited lime in greater quantity above than below, and have in the lapse of time built out or cemented together the rocks and debris of the canyon until a firm cemented mass was formed, under which the water cut its way."

MESA FORMATION, TUCSON.

The mesa upon which the University of Arizona is located consists chiefly of horizontal deposits of washed gravel and sand derived from the breaking down of granitic and gneissic rocks. The nature of the fragments indicates that they came from the canyons and cliffs of the Santa Catalinas and the Rincon Mountains. It is more than probable that a large part of the deposits came from the Sabina Canyon, the largest and most important drainage canyon from the Santa Catalina range.

* See Paleontology of Fortieth Parallel Survey, IV, 27 and Pl. II, Fig. 8.

In sinking a well to obtain water, just north of the northwest corner of the university tract, to a depth of 85 feet, the following succession of layers were cut through:

*Section of the mesa formation.**

Feet.	
6	—Thin sandy soil 3 to 12 inches, then caliche and pebbles; hard cement.
6	—Coarse gravel—granitic.
6	—Sand and water-worn bowlders.
2	—Red and clay-like earth.
2	—Red sand.
2	—Soft caliche—a calcareous cemented mass.
6	—Hard sand.
3	—Hard sand and gravel.
11	—Sand, cemented and aggregated in lump
3	—Red clay.
30	—Red clay and sand.
8½	—Sand and bowlders.
3½	—Water in sandy layers.

Most of the closely cemented sand and gravel not enveloped in caliche is well filled with small, sparkling crystals of calc spar, which appears to be the cementing material holding the grains of sand together.

FORESTS AND THE PRODUCTION OF LUMBER.

As formerly reported, Arizona has the largest unbroken forest of pine timber in the United States. The pine forests of northern and central Arizona cover an area of about 2,700 square miles, or approximately 1,750,000 acres. Detached bodies of timber are found in various parts of the Territory at altitudes above 5,000 feet, but do not exist in large enough quantities to make them of any special commercial value except for fuel. In the larger forests on the San Francisco range the pine trees run from the sapling size up to 4 feet in diameter. Common saw timber runs from 12 to 36 inches in diameter usually, the logs averaging about four to the 1,000 feet of lumber.

Arizona has an ample timber supply for the home consumption of a large population for many years. The price of common lumber varies from \$12 to \$10 for 1,000 feet, according to locality. The excessive price is on account of expensive transportation to localities remote from the source of supply. This will be remedied by the construction of railroads.

The principal kinds of timber used for fuel are pine, oak, juniper, and mesquite, and the supply is usually bountiful in all populated parts of the Territory. The principal shipping points for lumber are Flagstaff and Williams, on the Santa Fe Pacific Railway, in Coconino County.

My belief is that the pine-timber resources of this Territory will be quite sufficient for any population we will have, near or remote, even with wasteful and improvident methods, for at least one hundred and fifty years, but if properly conserved, they can be made to furnish all the timber needed for wise use by all the people this Territory can support for all time to come. I base this upon my knowledge of the timber to this particular forest. The increase by growth is to-day vastly in excess of the quantity being removed.

Conservative judges and estimators of timber who have had greater experience than I, place the quantity of timber on the Colorado Plateau at about 8,000,000,000 feet. This includes the Coconino forest, but does not include the forests of the White Mountains nor the timber in the Santa Catalinas, Santa Ritas, nor in any other of the timber-covered regions of the Territory.

* This record was kept by Mr. W. W. Miller, who dug the well.

STOCK RAISING.

Following is the report of the live-stock and sanitary board on the condition of the stock-raising industry in the Territory during the past year:

During the past year the live-stock interests in our Territory have grown and flourished.

The great advance in prices on all kinds of live stock has brought thousands of dollars into the pockets of the cattle and sheep men all over Arizona, and there is good reason to believe that for some years these prices will be kept up, if not bettered.

Arizona has been scoured from one end to the other by buyers for everything salable until it looked at one time as if we would be left without any cattle or sheep at all for future sales. But the vast resources of the Territory were never better exhibited than here, for, in spite of heavy shipments from feed lots and ranges, Arizona still has left many thousands of cattle and sheep for next year's buyers.

CONDITION OF THE RANGES.

Our ranges were never in better condition since the Territory was settled. While in some few parts there was a lack of spring rains, making grass scarce and keeping the stock thin, still it was not serious enough to cause any losses.

In the greater portion of the Territory, however, and especially in that part lying on the great Colorado Plateau in northern Arizona, along the line of the Santa Fe Pacific Railroad, the grass conditions have been superb.

Heavy snows last winter filled all the tanks and reservoirs with stock water and soaked the ground so thoroughly that the very first warm spring weather brought the green grass.

All during the month of May these favorable conditions existed, and in June, which is our driest month, nearly the entire Territory was treated to an unexpected downpour, which freshened up the grass, filled the water holes, and was very beneficial in its general effects.

Grass was never finer in Arizona than it is now, and the cattle are all fat and flourishing.

INCREASE.

From every part of the Territory come reports of heavy calf crops. This is due to several causes.

The range conditions of last year were excellent, so that cattle were in good condition to breed, and, more than all this, the cattlemen of Arizona have been buying blooded bulls for their ranges, until the "shortage of bulls" (that trouble which almost ruined the range business a few years ago) is heard of no more.

As with the cattle so it is with sheep. The sheep men of northern Arizona made an unusually heavy lambing last spring, and it was no uncommon matter to hear of lambings where 110 per cent were saved and raised, while he was indeed unfortunate who did not make it at least 95 per cent. By 110 per cent I mean that to every 100 ewes the flock master raised 100 lambs.

NUMBER OF STOCK IN THE TERRITORY.

The assessment returns for this year not having been made yet, it is impossible to give any absolute figures as to the total number of stock now on the ranges and upon the farms in our Territory. It is safe to assume, however, that in spite of the heavy shipments made from every railroad station, Arizona has quite as many cattle as last year.

As for sheep, in addition to the splendid natural increase, we have received from the drought-stricken regions of California almost 100,000 head of fine graded sheep, which are scattered over the ranges in northern Arizona and which have added materially to the tax-producing resources of those counties.

In allowing these sheep entrance into Arizona the live-stock board took every precaution to guard against bringing in any disease.

Every bunch was carefully dipped before shipping, and a certificate was demanded from a competent veterinarian stating that they had been so dipped and were free from other contagious diseases before they were allowed to cross the line.

Owing to the drought, Arizona could have also received several thousand head of cattle from California, which would have been a very welcome addition to our herds, they being of a superior class and breeding, but, owing to the prevalence in California of the dreaded "fever tick," it was deemed advisable not to allow them to come in and mix with our native cattle. This point will be treated further under the head of "Sanitary work."

OVERSTOCKING THE RANGES.

The bitter experience that Arizona stockmen, in common with the range owners of all the far Western States, underwent in 1892 and 1893 will hardly be repeated for many years.

It is generally understood that the country will not stand such immense drains upon it as were made during the years from 1888 to 1893, especially when a series of years may fall short in the annual rainfall.

"Fewer stock and better" is the generally accepted plan, and under this scheme there is grass in plenty for them all.

At the same time it is my opinion that the sheep owners in some localities of northern Arizona have approached dangerously near the line of safety, not for want of grass but of water.

Especially in Coconino and adjoining counties will it be wise for the sheepmen to see to their water supply, for, while they have grass in almost boundless quantities, the water supply in a dry year is deficient.

All this, however, can readily be avoided by building tanks and conserving the waters that now run to waste.

This has been done to a considerable extent, and the success of the Santa Fe Pacific Railroad Company in building their large reservoirs and dams along their line will be a great stimulant to further work in this direction.

With a greater water supply, the range resources of the northern part of our Territory can almost be quadrupled.

IMPROVING THE STOCK.

As before stated, the cattlemen have been foremost in providing the very best of blood for their herds. The finest strains of Herefords in the East have been brought here to grade up our herds, until to-day Arizona cattle stand in the markets of the United States unexcelled for color, form, and rustling qualities.

And it is this last quality which gives the Arizona cattle their most valuable point, and makes them eagerly sought after by the owners of the great steer ranges in the far North, as well as the buyers for the middle Western feed lots.

Their hardiness is unequalled, and whether on the plains of Montana and Dakota, with a blizzard raging, or in Kansas or Nebraska, with 3 feet of snow and a norther howling around, they always can be depended on to pull through, if any animal can.

With the cattlemen the Herefords have been the favorite breed, and we have in our borders two great ranches where blooded animals of this breed may be found, the equal of any strains in the West.

I allude to the "Sierra Bonita" ranch and herd of Col. H. C. Hooker, near Fort Grant, and the "San Rafael" herd of the Hon. Colin Cameron, in Pima County. Both these gentlemen have spent thousands of dollars and many years' hard work in breeding up a herd of cattle that shall be second to none, and the immense sales of their bulls this year at what must be considered almost extravagant prices prove that their efforts have brought them profit as well as success.

Among the sheep men the Shropshire or "Black-nosed" sheep have of late been a favorite breed. They are a large-framed animal, carrying a large amount of wool, are very hardy, and seem to be unusually prolific in our climate.

The Scott Brothers, in Navajo County, were among the first sheep men to import these sheep, and their herds now show the improvement to a remarkable degree. Others have quickly followed their example, until Arizona sheep have made a name for themselves in the markets of the United States.

PRICES.

The prices of live stock have steadily advanced during the past year. Owing to the drought in California, the feeders of the Salt River Valley were called upon to supply nearly all the beef for southern California, which caused prices to advance until at this writing first-class beef steers are quoted at from 4 to 4½ cents on the hoof, a price which has not been equaled for many years.

As to the rest of the Territory, there is very little beef sold, so that it is not possible to compare prices, but the following are the ruling prices to-day for the classes of cattle given and known as "stockers and feeders:"

Dry cows.....	\$19 and \$20
Calves.....	8 to 10
Yearling steers.....	18 20
Two-year steers.....	20 22
Three-year steers.....	24 25

At these prices thousands have been shipped from Arizona to the northern ranges during the past six months, and thousands more are still to go.

At this writing mutton sheep shipped from Holbrook to Kansas City are bringing their owners a net price of from \$3.25 to \$4.45 per head, which is indeed a very satisfactory figure.

For sheep on the range the ruling price is about \$2.50 per head, but it is hard to find many even at this figure.

NUMBER SOLD.

It is too early in the season to predict the total shipments for the year, but an approximate estimate of 250,000 head is, I think, conservative. Allowing \$20 each as the average price paid, we have received from other States a total of \$5,000,000 for our cattle this year.

The number of sheep shipped has been considerable, but inasmuch as no returns are made to our board nor other records kept of sheep shipments it can only be guessed at.

I am told by Hon. James Scott, of Holbrook, one of our leading sheep men, that in his opinion about 50,000 head of sheep will be shipped this year and between 3,000,000 and 4,000,000 pounds of wool.

Taking the sheep at an average of \$3.50 per head and the wool at an average of 11 cents per pound, we have a grand total of \$615,000 received by the sheep men of our Territory from their flocks. Mr. Scott estimates the total number of sheep in Arizona at 500,000 head, and that they will shear an average of 7 pounds per head per year.

THE NEW LIVE-STOCK LAW.

Arizona has now on her statute books one of the best laws ever passed for the protection of the stockman. The present live-stock sanitary board has been charged with the very onerous and thankless task of putting this new law into effect, and it has proven very laborious.

Few foresaw the immense amount of work that this new law would entail, but to-day the work is practically complete, and the new law is working smoothly and satisfactorily. Under our old system of registration of brands by counties it was possible and of frequent occurrence for one man to record a brand in one county and another man, purposely or accidentally, to record exactly the same brand in an adjoining county. Inasmuch as the animals wearing these brands ranged at will over the country, and the county lines offered no barrier to their travels, it was a source of endless confusion and litigation.

Arizona was the last of the range States to do away with this county system and have one central place where all brands must be recorded, and where one set of men could pass on the granting of new brands. As at present enforced it is impossible for two men to have exactly the same brand anywhere in the Territory, with the exception of those who under the new law were transferred from county records and which of course will be respected. But as owners are learning that their brand is given by others than themselves they are applying to the board for new brands, and gradually the old duplications will be done away with.

As examples of this duplication under the old law I will state that there were no less than twelve owners using the X brand, the F brand, the A brand, the N brand, the Z brand, and the J brand, besides hundreds of cases where two men had the identical brand in use in different counties.

The dangers of this were not so apparent until our heavy shipments of cattle were begun and the inspectors were confronted with the difficulty of determining to whom the cattle belonged when they had the same brands. Past live-stock boards have found themselves sorely perplexed to determine to whom to pay the money for stray animals when half a dozen claimants appeared, each owning in some county the brand worn by the stray.

There are now upon our brand books something like 8,000 brands and marks; and the protection afforded to each owner is almost absolute. He can transfer his brand in exactly the same manner as a piece of real estate, and men buying cattle can at once find, from the records, in whose names the brands are recorded and whether there are any liens or other attachments upon the cattle.

Of course, in putting into effect such a large work there has been some friction and difficulty. Many cattlemen did not avail themselves of the provisions of the law to transfer their brands from the old records, hence found themselves barred from obtaining their old brands. This, of course, was unfortunate, but was not the fault of the law nor its enforcement. It was wholly the fault of the men themselves. The present board took hold of this work at a very critical period, when, owing to the severe illness of the secretary it was months behind and the work of the office was piled up mountain high. New issues had to be met by new rulings, many delicate points had to be considered and acted upon, and conditions which were not foreseen when the law was passed were taken up and handled to the very best of our ability.

This work was an exceedingly hard and disagreeable task, and especially so as the

members of the board were all business men with private affairs which demanded their attention almost constantly. Yet for over two months the work was carried forward, assisted by as many clerks as could work around the books, until to-day it is practically completed.

The board members neglected their own business, working many days from 9 a. m. until midnight in order to hasten matters, and when I say that we have personally compared every one of these 8,000 brands in order to guard against mistakes, and that over a thousand additional brands were compared and rejected owing to conflicts with other brands, I think the work of the board will be appreciated.

In addition to this thousands of letters were received and promptly answered, the daily mail of our office for several months averaging close to 200 letters, while the office work was often seriously delayed by the number of visitors who called to personally inquire as to points under the new law.

It has been the aim of the board to answer every inquiry as promptly and fully as possible and we have been most fortunate to secure the services of Mr. H. Harrison as secretary.

Mr. Harrison's work in the office has been highly satisfactory. He has been extremely diligent in hastening to completion the work of the board, and the books and records of the office are a monument to his ability, skill, and neatness.

In addition to the work entailed by this new law the ordinary routine work of the office has been kept up to date, which in itself is a matter of no small importance.

The amount received for stray animals this year far exceeds that of any previous year. It is a pleasure to state that at this time there is not a single stray claim, where the claimant has any right to the money whatever, unpaid.

With the brands of the whole Territory at his hand the chairman is able at once to determine to whom the money should go, except in cases where the brand is not on record, when it has been our rule to require some satisfactory evidence of ownership before paying the claim.

It should be borne in mind that there are parties all over the Territory who make it their business to scan the columns of the stray list and put in a claim for every animal advertised that they can see the least possible chance for getting the money. The principal objectors to the operations of this law are this class of persons, who, when their claims are rejected, rail against the board and deem themselves aggrieved.

It is only just to ourselves to say that the board is sincere in its efforts to pay these claims to the rightful owners and that in the majority of the cases the claimants are utter strangers to us, so that we can have no possible personal motive in making our decisions. The same point will hold good in the matter of the rejection of brands. It would be by far the easiest way for us to allow a brand if it were possible to do so, but inasmuch as under the law we are held responsible for our actions in protecting brands already recorded we are forced to be careful and just to all parties.

As an illustration of the difficulties in determining the ownership of strays I will state that for a stray steer sold at Fort Huachuca in 1897 there were no less than ten claimants. I think six of them had this brand recorded by transfer from county records, while the balance had unrecorded brands. These ten claimants came from almost every county in the Territory, and the board, after carefully comparing the claims, paid the money to a party living at the shipping point but whose brand was not on the Territorial books. Although his brand was not on record he furnished us good evidence that he owned cattle in this brand, and as he lived and owned cattle right at the point of shipment it was deemed justly his steer.

As a matter of fact nearly every other one of the claimants, upon learning that their claim had been disapproved, wrote the board complaining of their action and berating them.

I cite these instances to show the cattlemen the many difficulties that surround these matters and to assure them that we are trying to deal justly and fairly with everybody, whether his brand be recorded or not.

CHANGES IN THE LAW.

There are some points in the new law that need amending and improving, and at the proper time I shall, on behalf of the board, suggest these to you. Probably no law was ever passed but that it was necessary to alter and amend it, yet I think the present live-stock law of Arizona is remarkable for its clearness and lack of ambiguity. What few changes are demanded can be easily made by our coming legislature, and the stockmen should see to it that their representatives are interested in this subject.

The law has already stood the test of several legal attacks, and the rulings of the board, which under the law are part of the law, have been sustained by the decisions of both the courts and the attorney-general.

SANITARY WORK.

This past year has been an unusually active one in this line, and our very capable and efficient veterinarian has worked literally day and night to protect the health of the Territory.

Taking them up in their importance I will say that the most serious trouble was over a shipment of cattle from below the Government quarantine line in Texas.

To thoroughly understand this I will explain that the United States Government, which establishes this line, allows cattle from below there to go anywhere in the United States between November 1 and January 15. The idea of this is that the cold weather of those months will kill the ticks which carry the disease germs, and so no harm may come to the cattle coming in contact with those from below the line.

This will hold good so far as Northern climates may be concerned, but in our warmer latitudes it will not do. The question has never arisen, however, because few cattle had been shipped into Arizona except high-bred animals, which were naturally free from disease. This shipment was offered the Southern Pacific Railroad at El Paso about December 16, 1897, which road asked for permission to bring them into our Territory under our rules. As the cattle were heavily infested with ticks, and came from below the line, they did not have nor could they procure a clean bill of health from the Government inspector at El Paso.

The matter came before the board at a full meeting and after several days of delay and careful investigation we decided that under our laws we had no power to keep these cattle out in this open season, but that the instant they crossed the Territorial line we could place them in quarantine and hold them until all danger was past, owner to pay all expenses of quarantine.

We hardly expected the owner to accept these conditions but to our surprise he did so and the cattle had to come. They were met at the State line by Dr. Norton and were placed in a close quarantine for about ninety days at Willcox until every evidence of danger was gone.

However, so fearful were the cattlemen in the vicinity that there were still some lurking germs of fever left that they voluntarily made up a purse to buy the cattle and ship them out of the country rather than allow the owners to turn them loose on the open range at Willcox as they desired. The cattle were then taken to a pasture and kept by themselves for two or three months and sold for beef.

The willingness of the cattlemen of Wilcox to lose over \$1,000 before they would risk the danger of infection, even when the board and Dr. Norton assured them there was positively no danger, is a strong argument in favor of the most stringent rules against such danger.

The board has now taken such steps and published such rules as will prevent anything of the kind happening in the open season again. We are too far south to trust to the winters to kill the ticks, and it is a satisfaction to state that our position in this matter has met the hearty approval of the head of the Bureau of Animal Industry, Dr. Salmon, who is assisting us in every way.

Hardly had we got rid of these Willcox cattle when the cattlemen of California, whose herds were starving, owing to the drought in that State, were knocking for admission.

California being also below the line, and badly infested with ticks, it was decided by the board to be a wise policy to refuse them admission. This led to many criticisms upon us by parties who do not understand the conditions that exist in California, and it must be confessed that with hundreds of miles of grass lying idle it did seem hard to refuse them entrance. But self-preservation is the first law of nature, and in trying to do our California friends a favor we were liable to do ourselves an irreparable injury that would have ruined every cattleman in Arizona and placed us forever below the fated "fever line." Subsequently one or two States did admit California cattle, and inasmuch as several cases of fever have developed amongst the native cattle, it is deemed strong evidence that we were indeed wise to refuse to let them come in.

In this connection I deem it but right to refute the statement that we even refused the cattle from California passage through the Territory because they had to be unloaded en route. Quite to the contrary, we established a yard at Peach Springs, on the Santa Fe Pacific, and at Arizola, on the Southern Pacific, to be known and used as "quarantine yards" and kept solely for California cattle.

In regard to the cases of fever imported into the Salt River Valley from California and which have been watched so closely from its discovery, I am happy to say that while we shall keep the suspicious ranches in a close quarantine for some time yet, still it is the opinion of us all that we have utterly stamped out every vestige of fever.

The cattlemen of Arizona owe to Dr. Norton a debt of gratitude for his work in this case. His high standing with the Washington authorities enabled us to act and be in harmony at all times with the Bureau officials, and they placed in his hands

the entire management of this case, well knowing that he would handle it with absolute integrity and justice. Had it not been so, it is the opinion of every man posted on the subject that we should have been in quarantine long ago and our live-stock industry ruined.

It is no overestimate to say that a quarantine on Arizona, such as California has, would lower the value of cattle all over the Territory over 50 per cent, if not more.

The last trouble was with our neighbors on the south. Fever ticks have been found for some time in the Arispe district, in Mexico, and as early as December last I called the attention of the Bureau in Washington to the danger of our being infected by these Mexican cattle, to which they replied that they were carefully watching it and would not allow any fever cattle to cross the line.

In May of this year Dr. Norton was called to Bisbee to look at some cattle there, and after several days of careful investigation enough evidence was found to warrant him in refusing them admission to our Territory, although no objection was made to their being loaded at Bisbee for shipment to other States, provided the Bisbee yards were cleaned and fumigated.

However, no one else wanted them any more than we did, so the entire shipment of over 7,000 head were turned back and not allowed to come across.

The General Government is still investigating, and we are cooperating with them in every way to protect the health of the cattle of Arizona.

Among the horses there has been slight trouble with glanders. Curiously enough, both cases, one in Navajo County and the other in Maricopa County, can be traced back to a horse that came into Arizona some years ago from Utah. It is evident that the dread disease lies dormant for a long time until the proper conditions give it an opportunity to develop.

I am glad to say that in both these cases it has been confined to the horses first afflicted, and no spread of the disease has been discovered.

There has been a constant call for the services of Dr. Norton from all parts of the Territory and it has been a hard matter to attend to all of them. Glanders is so greatly dreaded and so easily spread that every man having a horse suffering with a bad cold thinks it is glanders and at once demands the presence of Dr. Norton.

This, of course, is what he is supposed to be paid for and what he is presumed to do, but as the expense of sending him on these errands is very heavy, Dr. Norton has always endeavored to satisfy himself that there was some real danger before subjecting the Territory to this expense.

As a sample of these calls, I will state that at one time this spring there were demands for him to come and see suspicious horses at Bisbee, Holbrook, Clifton, and Prescott.

We have always urged on owners of stock to be certain they had a genuine case before sending for the Territorial veterinarian and have found ourselves criticized because we have not at once upon receipt of letters sent Dr. Norton to their horses.

Nevertheless, we have always endeavored to be as consistent as possible, and while not ignoring the least call for such services to be quite certain that it would justify the expense before sending him.

Among the hogs there has, fortunately, been no recurrence of the severe visitation of the disease that cost the hog raisers of Glendale and vicinity so dearly a few years ago, but at the same time a watchful eye is kept upon all importations of hogs, none being admitted until they have been carefully examined and found absolutely healthy.

FUNDS.

Under the law creating this board it was made the duty of the chairman to transfer to the Territorial treasurer all moneys for strays which have been in their hands unclaimed for more than one year.

In accordance with this law, I have transferred to Col. C. W. Johnstone, Territorial treasurer, the sum of \$3,500, being the amount of moneys in our hands so unclaimed.

It is a matter of congratulation to the cattlemen to feel that this board which was created for their benefit and protection is so nearly self-sustaining and virtually costs the taxpayers but little. The expenses of putting into effect this new law have been very heavy, and especially as the law made it the duty of the board to do certain things, but made no appropriation to pay for them.

In these cases we obtained from the attorney-general, Hon. C. M. Frazier, his written opinion as to our rights in the premises.

INSPECTION SERVICE.

The inspection service was never in better condition than it is at present. The system is as near perfect as is possible where there is no stated salary and only the fees to pay for the work done.

New Mexico and other States pay their inspector a regular salary, and by this means get the very best men for the work.

Of course at the large shipping points it is an easy matter to fill the place, but in the little towns and mining camps, where stealing of cattle for beef is constantly

going on, it is a very hard matter to get a good man who will see to it that the law is strictly enforced.

Removals in the service have been made only when for the good of the service, and then only after careful investigation has shown the party to be incompetent.

There is appended hereto a list of cattle shipments made up to July 1, 1898, showing points of shipment and also number slaughtered during the same time.

The following is a list of the various inspection points, together with the number and class of stock shipped and slaughtered for the fiscal year ending June 30, 1898:

Town.	Slaugh- tered.	Cattle shipped.	Hogs shipped.	Horses shipped.
Arivaca.....	102			
Ashfork.....	120	7,282		
Aravaipa.....	100			
Arizola.....		1,685	562	
Apache.....	945			
Buenos Ayres.....	30			
Benson.....	280	4,706		
Biabec.....	1,790	14,143		
Biglun.....	65			
Briggs.....	0	449		
Bowie.....	63	599		
Calabasas.....	3	12,307		36
Casa Grande.....	142			
Clifton.....	1,157	2,533		
Congress.....	608	1,975		
Crittenden.....	192	1,838		
Chaparral.....	91	265		
Concho.....	6			
Canyon.....	10			
Crownking.....	139			
Duncan.....		299		
Don Luis.....		4,738		
Del Rio.....	14	3,940		
Fairbank.....	43			
Flagstaff.....	647	7,646		
Florence.....	248			
Geronimo.....	126	20,833		
Gilabed.....	125	1,186		
Glendale.....	110	11,596	3,045	22
Globe.....	1,167			
Greaterville.....	20			
Grant.....	290			
Hackberry.....	136	8,106		
Holbrook.....	232	14,574		12
Huachuca.....	1,034	6,310		
Jerdine.....	1,448			
Kirkland.....	41	5,862		
Kingman.....	485	266		
Mammoth.....	274			
Mesa.....	525	67		
Morenci.....	351			
Navajo.....	23	3,348	255	
Nogales.....	553	1,674		
Oro Blanco.....	159			
Pantano.....	22	3,764		
Prescott.....	1,873	768		
Phoenix.....	4,380	13,575	322	49
Palomas.....	12			72
Pearce.....	203			
Peach Springs.....	8			
Redington.....	47			
Seligman.....	107		532	
San Carlos.....	1,429			
Springerville.....	14		1,884	
San Simon.....	10		10,613	
Sonoita.....		1,646		
Safford.....		2,031		
Sahuarito.....	10			
Steam Pump.....	59			
Solomonville.....		784		
Tucson.....	4,116	33,646		
Tempe.....	450	13,966		
Tombstone.....	300			
Thomas, Fort.....	56			
Table Mountain.....	38			
Wickenburg.....	42	728		
Willcox.....	346	41,648		
Walnut Grove.....	18			
Winslow.....	624	2,175		
Williams.....	883			
Yuma.....	1,805	360		
Total.....	80,726	253,318	17,193	191

During the year there were sold by the duly appointed inspectors of the board strays to the number of 407 head, amounting to \$4,846.27, the proceeds of which were sent to the board, as provided by law, to be paid to the owners when found. During the same period the board paid 313 claims, amounting to \$3,764.14.

TERRITORIAL PRISON.

The report of the condition of the Territorial prison for the year ending June 30, 1898, shows the following as gleaned from the reports made during that time, and the prison record kept of prisoners, as received and discharged.

STATISTICAL.

There were in confinement, June 30, 1897, 206 male prisoners and 3 female prisoners, and the receipts and discharges during the year were as follows:

	Received.		Discharged.	
	Male.	Female.	Male.	Female.
Third quarter, 1897	19		29	1
Fourth quarter, 1897	34	1	53	3
First quarter, 1898	10		15	
Second quarter, 1898	23		16	
In confinement, June 30, 1897	206	3		
Total	292	4	113	4

This leaves in confinement, June 30, 1898, 179 male prisoners.

FINANCIAL.

The expenditures and receipts for the year, by quarters, are as follows:

	Expenditures.	Receipts.
Third quarter, 1897	\$9,681.38	\$1,289.01
Fourth quarter, 1897	12,160.24	1,048.73
First quarter, 1898	12,463.39	635.11
Second quarter, 1898	11,073.03	716.15
Total	45,378.04	3,689.00

The following is a brief outline of the place of birth, habits, religion, and nature of the crime of each prisoner:

Number from each county:		Education:	
Apache	3	Read and write	111
Coconino	14	Neither read nor write	68
Cochise	23	Total	179
Gila	15	Crime:	
Graham	19	Against person	75
Maricopa	28	Against property	104
Mohave	2	Total	179
Navajo	4	Intemperate	127
Pima	36	Temperate	52
Pinal	11	Total	179
Yavapai	22	Use tobacco	174
Yuma	2	Do not use tobacco	5
Total	179	Total	179
Nativity:		Religion:	
Native born	84	Catholic	102
Foreign born	95	Protestant	25
Total	179	No religion	52
Religion:		Total	179
Catholic	102	Married	42
Protestant	25	Single	137
No religion	52	Total	179
Total	179		

LABOR.

There have been 9,545 days' work performed by prisoners on the canal under contract with the State of Arizona Improvement Company at the contract price of 70 cents per day, which was a net earning to the Territory of \$6,981.50. Beside which the prisoners have cut for the use of the prison about 4,000 cords of wood. This wood cost about 50 cents per cord as against the contract price heretofore paid contractors of \$2.75 per cord.

Prisoners cutting this wood were allowed a deduction of one month from their sentence for every 12 cords cut, and the result was highly satisfactory.

COMMERCE AND RAILROADS.

All the railroads of the Territory report a very satisfactory increase in the volume of business during the past year, and considerable construction work has been done on new lines. Nearly all of the railroads of the Territory have made numerous and extensive improvements in their rolling stock, roadbeds, building new bridges, relaying ties and rails, repairing, overhauling, and renewing passenger equipment, buildings, etc.

The Gila Valley, Globe and Northern Railway connects with the Southern Pacific at Bowie Station, in Cochise County, and extends north to Globe, a distance of about 140 miles. This road will certainly prove of very great benefit in the way of development and civilization. It traverses the rich agricultural valley of the upper Gila, affording the farmers necessary transportation facilities for their produce, crosses the San Carlos Indian Reservation, the home of the hitherto dangerous Apaches, impressing them with its civilizing influences, and gives to one of the wealthiest and most productive mining sections in the Territory, which surrounds the city of Globe, an outlet for its great mineral wealth and facilities for developing and working the mines, the value of which under these improved conditions can scarcely be estimated.

The Prescott and Eastern Railroad has been constructed during the present year from a point on the Santa Fe, Prescott and Phoenix Railway, about 6 miles north of Prescott, to Mayer, a distance of 26½ miles, in order to provide railroad facilities to the rapidly developing mining districts tributary thereto. This line penetrates a rich mining section, and will undoubtedly prove an important factor in the development of the Territory.

The line of the Arizona and Southeastern Railroad from Fairbank to Bisbee, a distance of 36.2 miles, has been entirely relaid with 60-pound rails, and a branch line has been built from a point 8.8 miles distant from Bisbee to the international boundary, a distance of 4 miles.

The Santa Fe and Grand Canyon Railway has been surveyed from the town of Williams, on the Santa Fe Pacific, to the Grand Canyon of the Colorado, a distance of about 65 miles, and some construction work done. This road when completed, it is claimed, will develop some rich copper and coal mines, and furnish an easy means of access by tourists to the greatest natural wonder of the earth, the incomparable Grand Canyon of the Colorado.

A company has also been incorporated to build a railroad from Kingman, Mohave County, on the line of the Santa Fe Pacific, to the Grand Canyon through a rich mineral section.

The following railroads are now being operated in the Territory:

	Miles.
Southern Pacific of Arizona	383
Santa Fe Pacific	393
Santa Fe, Prescott and Phoenix	197
Gila Valley, Globe and Northern	140
New Mexico and Arizona	87
Arizona and New Mexico	38
Arizona and Southeastern	54
Maricopa and Phoenix and Salt River Valley	43
Prescott and Eastern	27
Congress Gold Company	4
Total	1,366

The Southern Pacific passes along the southern part of the Territory from Yuma, on the Colorado River, to the eastern boundary of Cochise County, passing through the counties of Yuma, Maricopa, Pinal, Pima, and Cochise.

The Santa Fe Pacific crosses north of the center of the Territory near the thirty-fifth parallel and passes through the counties of Apache, Yavapai, Coconino, and Mohave.

The New Mexico and Arizona runs from Benson, on the Southern Pacific, in Cochise County, to Nogales, in the same county, at the Mexican line.

The Arizona and New Mexico runs from Clifton, in Graham County, to the Southern Pacific at Lordsburg, N. Mex.

The Arizona and Southeastern runs from Bisbee, Cochise County, to Benson, on the Southern Pacific, in the same county.

The Maricopa and Phoenix and Salt River Valley runs from Maricopa, Pinal County, on the Southern Pacific, to Phoenix, Maricopa County, with a branch from Tempe, Maricopa County, to Mesa, in the same county.

The Santa Fe, Prescott and Phoenix runs from Ashfork, on the line of the Santa Fe Pacific, through the counties of Yavapai and Maricopa, to Phoenix.

The Gila Valley, Globe and Northern runs from Bowie, on the Southern Pacific, in Cochise County, to Globe, Gila County.

The Prescott and Eastern runs from a point on the Santa Fe, Prescott and Phoenix, Yavapai County, to Mayer, in the same county.

The Congress Gold Company Railroad runs from Congress Station, on the Santa Fe, Prescott and Phoenix, in Yavapai County, to the Congress mine.

EDUCATION.

Following is a report of the superintendent of public instruction on the public schools of the Territory during the year:

PUBLIC SCHOOLS.

The past year has been one of steady progress in the schools of the Territory. Reports to this office from the various county superintendents state that greater progress has been made, and as a rule the schools are in better condition, than ever before in their history. I find throughout the Territory an increased and increasing interest in school work, not only among the teachers, but among patrons as well. The statistical reports bear out the statement that our schools are now enjoying a period of prosperity and progress which can not fail to be gratifying to all friends of education. I have found in all parts of the Territory school officers who are diligent in the discharge of their duties and enthusiastic in doing efficient work for the schools.

REVENUE.

For the support of the schools an annual tax of 3 cents on each \$100 of taxable property is levied. The amount so obtained is apportioned to the several counties according to the school population between the ages of 6 and 18 years. For the further support of the schools the supervisors of each county are required to levy an annual tax of not less than 30 cents nor more than 80 cents on each \$100 of taxable property in their several counties. The amounts so raised from taxation are further augmented by amounts received from the lease of school lands, which has amounted to no inconsiderable sum the past year, poll taxes, money received from fines and forfeitures, and gambling licenses.

The apportionment of county school moneys is based upon the average daily attendance in the schools.

TEXT-BOOKS.

Many of the text-books in use in our schools had become more or less antiquated and it seemed desirable that some changes should be made so as to give to our schools the advantages of the latest advances in educational work. Changes such as were deemed for the best interests of the schools have now been made, and it is believed that the result of the change will be highly beneficial to the schools; besides there will be a great saving to the patrons on the cost of the books.

TEACHERS, TEACHERS' CERTIFICATES AND DIPLOMAS.

It is safe to say that in no State or Territory are there more earnest and efficient teachers than are those of Arizona. They are progressive and devoted to their work, and have brought the schools up to a very desirable standard of excellence.

The standard for examinations, while not over critical, will compare favorably with that of any other State or Territory. Those who have taught successfully for ten years, at least one of which was in this Territory on a first-grade certificate, and who shall pass a successful examination in the history of education, pedagogy, school economy, and school government are entitled to life diplomas.

Teachers who have taught successfully for five years may receive educational diplomas valid for six years, without examination.

Holders of diplomas from universities and chartered colleges may receive first-grade Territorial certificates without examination, at the option of the board of education, and those who pass the required examinations before the Territorial board of examiners, and those who pass the required examinations before county boards of examination, may receive first and second grade Territorial or county certificates.

Applicants for first-grade certificates must receive 85 per cent, and applicants for second-grade certificates must receive 80 per cent.

The following tabulated statement shows the condition of the schools of the Territory at the close of the school year ending June 30, 1898:

County.	Teachers.		School districts.		Boys enrolled.		Girls enrolled.		Total enrolled.	
	1897.	1898.	1897.	1898.	1897.	1898.	1897.	1898.	1897.	1898.
Apache.....	120	19	11	12	451	457	401	422	852	879
Cochise.....	25	27	18	20	566	673	477	594	1,033	1,267
Cocconino.....	12	11	6	6	244	236	244	240	488	476
Gila.....	15	15	13	13	293	251	240	198	533	449
Graham.....	33	38	24	29	870	954	848	955	1,718	1,909
Maricopa.....	89	93	47	47	1,985	2,068	1,711	1,869	3,646	3,937
Mohave.....	12	12	11	11	129	146	131	158	260	304
Navajo.....	30	22	14	15	366	408	392	453	758	861
Pima.....	43	46	25	29	991	1,084	842	922	1,833	2,006
Pinal.....	15	18	10	13	256	283	252	271	508	554
Yavapai.....	46	51	38	40	701	811	625	753	1,326	1,564
Yuma.....	14	13	10	9	211	223	195	284	406	407
Total.....	354	365	227	244	7,008	7,594	6,358	7,119	13,361	14,613

County.	Children of school age at last census.		Average length of school term.		Average salary paid teachers.	
	1897.	1898.	1897.	1898.	1897.	1898.
			<i>Months.</i>	<i>Months.</i>		
Apache.....	842	944	5.45	5.68	\$60.55	\$58.92
Cochise.....	1,378	1,448	6.47	7.50	73.80	68.00
Coconino.....	575	587	6.33	6.85	86.36	75.41
Gila.....	466	606	6.33	6.00	66.33	70.00
Graham.....	2,408	2,450	6.15	6.10	57.68	57.12
Maricopa.....	4,098	4,310	6.60	7.00	62.00	64.00
Mohave.....	312	282	6.98	7.40	70.83	74.98
Navajo.....	693	865	5.87	6.00	64.75	62.13
Pima.....	3,644	4,015	6.36	6.13	64.25	69.98
Pinal.....	790	758	6.00	6.00	65.00	60.00
Yavapai.....	1,721	1,831	6.11	6.90	72.50	67.60
Yuma.....	500	706	5.80	6.53	74.28	71.94
Total.....	17,427	18,802	6.37	6.50	68.69	66.67

County.	Teachers examined.		Teachers receiving certificates.		Rate of tax levied on each \$100.	
	1897.	1898.	1897.	1898.	1897.	1898.
Apache.....	15	9	9	4	\$0.60	\$0.65
Cochise.....	13	7	9	2	.55	.53
Coconino.....	7	2	5	2	.35	
Gila.....	12	5	8	5	.60	.55
Graham.....	7	9	0	6	.60	.60
Maricopa.....	41	25	26	20	.59	.60
Mohave.....	4	5	4	5	.55	.55
Navajo.....	18	5	9	3	.33	
Pima.....	9	18	8	16	.62	.31
Pinal.....	6	6	4	5	.45	.65
Yavapai.....	19	16	19	10	.50	.56
Yuma.....	2	7	2	7	.80	.75
Total.....	153	114	103	85	.56	.57

County.	Amount paid in salaries of teachers.		Total expenditures.		Valuation of school property.	
	1897.	1898.	1897.	1898.	1897.	1898.
Apache.....	\$5,560.43	\$6,124.35	\$7,079.21	\$7,769.66	\$10,938.00	\$11,585.72
Cochise.....	13,446.05	14,710.45	16,096.52	18,257.63	20,730.91	22,249.61
Coconino.....	6,463.13	7,490.00	10,002.17	10,604.86	30,065.00	30,508.50
Gila.....	6,409.00	6,448.75	7,823.39	8,646.08	3,780.00	5,000.00
Graham.....	11,595.31	15,662.82	14,722.66	16,921.30	12,735.43	12,014.50
Maricopa.....	44,050.60	46,317.31	61,848.48	66,213.76	178,096.00	202,945.00
Mohave.....	5,722.50	6,659.75	6,968.86	8,161.39	11,219.00	10,256.00
Navajo.....	7,597.87	8,013.35	11,892.34	14,897.83	12,074.26	13,896.92
Pima.....	20,554.65	20,653.00	27,894.31	28,087.24	88,060.00	88,985.39
Pinal.....	5,714.36	6,919.35	6,788.18	8,997.66	21,616.00	17,782.00
Yavapai.....	22,376.12	24,717.28	26,606.67	29,236.35	47,920.00	48,490.00
Yuma.....	6,591.05	6,177.98	8,225.86	7,595.99	8,145.25	8,424.00
Total.....	155,991.07	169,894.39	205,948.65	221,389.75	445,379.85	472,107.64

The above figures show an increase of school population of 1,375 over the census of 1897, and an enrollment in the schools of 1,252 in excess of 1897.

The average salary paid to teachers this year was \$66.67 as against \$68.69 last year.

The total expenditure for the maintenance of the schools this year amounted to \$221,389.75, being \$15,441.10 more than last year.

The valuation of school property last year was \$445,379.85 as against \$472,107.64 this year, an increase of \$26,727.79.

UNIVERSITY OF ARIZONA.

[From the annual report of the president of the university.]

The University of Arizona was established by act of the Territorial legislature in 1887, but it was opened to students for the first time in 1891. Its history, therefore,

as an educational institution is a brief one. Considering this short period of development it has made worthy progress and has attained to a good degree of efficiency.

The following facts with respect to the location, buildings, equipment, and work of the university, part of which are taken from the last register, will be of interest. By them it will be seen that the conditions under which the work of the institution is carried on are favorable to growth and development.

The University of Arizona is located near Tucson, the county seat of Pima County, one of the largest towns in the Territory.

Tucson is on the main line of the Southern Pacific Railway, 312 miles west of El Paso, Tex., and 500 miles east of Los Angeles, Cal. It is easily reached from both East and West without change, and has railway connections with central and northern portions of the Territory via Maricopa, and with Northeastern States via Deming. The town lies in a broad, flat valley, at an elevation of 2,400 feet above sea level, and is surrounded by mountains. Its dry, healthful situation, with its mild, equable climate, have made Tucson a famous health resort, particularly for pulmonary patients.

The winter climate is especially good. Its temperature is cool and refreshing, without being severe. The lowest temperature recorded during the average year is about 20° F. above zero. But little rain falls during the winter; fogs are unknown; cloudy days are rare, the percentage of sunshine throughout the winter being greater than that recorded in any other place in the United States. In the summer the temperature ranges high, but the dry heat of this region differs greatly from the moist and oppressive heat of the Eastern and Gulf States. Owing to the extreme dryness of the air the highest temperatures known are less oppressive to the senses and less dangerous to the health than the summer heat of the Mississippi States.

The total amount of rainfall averages less than twelve inches. Of this amount fully one-half falls during July and August, yet the amount is so small as not to materially increase the atmospheric humidity, and the summers are found remarkably healthy. In general the climate may be described as well suited to nearly all people, but is particularly beneficial to the young and to those who can not endure with comfort or safety the extremes of temperature and the sudden changes of Northern climates.

BUILDINGS.

The main building is 200 by 105 feet, two stories in height, the lower story of gray stone, the upper of red brick, and is completely surrounded by a wide two-story veranda. This building contains the offices, recitation rooms, laboratories, and apparatus rooms of the various departments, an assembly room, the libraries of the university and experiment station, and the Territorial museum. Adjoining the main building is the mining annex, 80 by 60 feet, filled with metallurgical machinery, while near by is the new brick building erected especially for the work in assaying.

Three cottages have been built. They are of brick, two stories in height, and were intended to accommodate each two families. They were originally designed for homes for instructors, but owing to the pressure for accommodations for students on the university grounds, two of the cottages have been converted into homes for young ladies, and furnish excellent accommodations for twenty-five persons, while the third is used as a residence for the president.

A dormitory, built of a fine quality of gray stone, two stories in height, has been provided as a home for male students. It contains a students' dining room, kitchen connected therewith, and twenty rooms, each large enough to accommodate two students.

Other buildings are the boiler house, which also contains the well and pump, whereby the water supply for irrigation and general purposes is obtained; the two greenhouses, one of which has just been supplied with a greenhouse boiler to furnish artificial heat when needed; a small cottage, and a temporary wooden building used as a young men's dormitory.

EQUIPMENT.

Library.—The library is increasing in efficiency with the growth of the institution. The books have been selected with great care, with a view both to the requirements of the various departments of instruction and also to the building up of a well-balanced, symmetrical collection of books. All the works are new and standard. The scientific works represent the highest and latest authority, while the literary and historical departments contain only the best known and most thoroughly tried authors. A main object in making the selection has been to furnish students with books of the highest class and to encourage them in habits of careful reading. Complete bound sets of the leading American periodicals are being collected every year, so that the library is already valuable as a means of research in the present-day problems.

The latest editions of the best cyclopedias and dictionaries are constantly at the students' disposal. The leading American scientific and literary publications, as well as the Territorial newspapers, are found in the reading room.

Aside from Government publications and pamphlets, the library contains 3,100 bound volumes, of which 800 have been added during the present year. Of the whole number about three-fifths are scientific works, the remainder belonging to general literature, biography, and history.

A complete card catalogue of authors and titles is maintained.

Chemistry.—The chemical laboratories are two in number. The smaller one, on the upper floor of the main building, is for the use of students, and is equipped for teaching the theories and practice of chemical science. The room for laboratory work is well lighted, provided with gas, good water, working desks, ventilating hoods, an abundance of apparatus, and chemicals with which to carry on experimental work, and can be made to accommodate about twenty-four students. Adjoining the large room is a small storeroom stocked with apparatus for demonstrating the principles of chemistry and containing well-selected collections of chemical substances.

The experiment station laboratory occupies three large working rooms and two small storerooms on the lower floor of the main building. This laboratory is devoted to analytical work in chemical investigations relating to the agricultural interests of the Territory. It is excellently equipped for the special lines of investigation in which it is engaged; and, although not primarily intended for the use of students, it has educational value for those who desire to witness the operations of a working laboratory. The equipment includes chemical balances, chemical apparatus and supplies, machinery for preparing samples, and special appliances for the analysis of milk, agricultural products, tanning materials, and soils.

Biology.—The biological laboratories occupy three rooms in the southwest half, second floor, of the south wing of the main building. These rooms are piped for gas and water and liberally provided with apparatus for research and for giving instruction on biological subjects. Students pursuing histological work are provided without expense with simple and compound microscopes, as the nature of their work demands. The laboratory is equipped with microtomes, culture baths, oven, and other accessories used in modern methods of research.

A herbarium, containing nearly ten thousand sheets of plants, mostly indigenous to the Southwest, a large percentage being from Arizona, is an important factor in the equipment. Some fifty cases of insects, including one large cabinet, is of value in giving instruction in entomology and to illustrate the economic insects of Arizona. The work in general and systematic zoology is greatly facilitated by the Herbert Brown collection of birds, and by other zoological material which has been brought together in the past five years.

To aid in the study of human and comparative anatomy and physiology there are provided articulate and disarticulate human skeletons, plaster and papier mâché models of the important organs, and microscopical preparations illustrating the structure of the various tissues. The equipment also includes special apparatus for use of advanced students in this department.

Agriculture.—Two rooms upon the first floor and near the central part of the main building are used for the work in the study of agriculture and for the agricultural experiment station headquarters. The equipment is quite complete. There have been imported from Europe several of the best Azoux models of portions of the domestic animals, showing normal and morbid conditions; also several cases of products of the vegetable kingdom. A very large collection of garden and farm seeds has been secured and arranged in jars and properly labeled. There is also a selection of garden tools and instruments used in veterinary surgery. Recently there has been imported from Germany a collection of charts illustrating the anatomy and physiology of some of the fruits and grains. Specimens of the best fruits, grains, and other farm products are constantly received for examination; also specimens of abnormal nature.

Laboratory work is provided for in the greenhouses, and in field work upon the university grounds. The general library contains many of the standard and most valuable of the recent publications upon agriculture and its various branches and the science on which it is based. All the bulletins and reports of experiment stations of the United States and foreign countries are on file in the station library, and the principal agricultural and horticultural journals are upon the table of the reading room.

Civil and hydraulic engineering.—Recognizing the fact that the first actual engagement secured by the civil engineering student will be either in the field with a surveying party or in the drafting office, the equipment of this department has been chosen with a view to developing the highest skill in these fundamental lines of work. Already liberal, it is being constantly enlarged.

In addition to a large number of technical books and periodicals contained in the general library, this department possesses a considerable number of valuable reference works concerning its special lines of investigation.

Mining and metallurgy.—The department of mining and metallurgy is well equipped for giving both theoretical and practical instruction in the arts of mining and metallurgy in all its branches.

The assay laboratory is equipped with assay furnaces for crucible work, for scorifying and cupelling, and for retorting mercury from amalgam. An adjoining room, supplied with water, gas, and electric current, has a roomy hood for work involving fumes, with tables and desks for student work, besides all needed appliances for assaying by dry and wet methods, including electrolysis.

The laboratory also has desks and fittings for the chemical work required in metallurgical and mineralogical investigations, and the analysis of ores, mineral fertilizers, and qualitative tests of minerals.

Mechanical engineering and physics.—The facilities for experimental demonstration of all important phenomena are very complete. The lecture table is supplied with gas, water, electric currents from primary and storage batteries and from the large dynamo.

Adjacent to the lecture room is the apparatus room, where are kept the many instruments owned by the university. Both these rooms open into the large physical laboratory, where the students verify for themselves the laws set forth in the textbooks and lectures.

These excellent facilities for instruction and scientific research, in the hands of an efficient faculty, afford a fine opportunity to the youth of the Territory to secure a liberal education.

During the past year the number of professors and instructors has been 15, and the students have numbered 156.

The academic work of the school will be understood from the following statement concerning the courses of instruction. These courses and all the privileges of the university are open to all qualified persons of either sex without charge.

Three regular four-year courses of study leading to a degree are offered, viz, literary and scientific, engineering and mining, agriculture.

In each course the work is partly required and partly elective. Four hours of recitation a day are required in each course as full work. In laboratory work two to two and one-half hours are considered the equivalent of one recitation hour.

Persons of mature age and with sufficient preparation, who are not candidates for a degree, will in some cases be admitted to regular classes as special students without having taken the required work of the lower years of the course; provided, however, that in all such cases they show to the satisfaction of the instructor giving the course that they can take the work with profit to themselves and without detriment to the work of the regular class.

Work is offered in the following lines: English language and literature, Latin, Spanish, French, German, history and civics, mathematics, physics, chemistry, biology, mineralogy and geology, drawing and shopwork, engineering, mining.

Students who have completed satisfactorily the required work and the specified amount of elective work in either of the four-year courses are given the degree of bachelor of science.

The advanced degrees of master of science and master of arts are conferred upon bachelors, graduates of this university or from institutions of equivalent grade, who have successfully pursued a course of study marked out by the faculty and requiring not less than one year.

The degrees of civil engineer, mining engineer, irrigation engineer, and electrical engineer are open to graduates, properly prepared, who have pursued special lines of post-graduate work in accordance with faculty regulations.

Besides this work of college grade, the university maintains a preparatory school, whose course, occupying three years, has been especially designed for those who have not had sufficient training to enter the classes of the freshman year.

It is not the desire of the faculty to engage in any work which can as well be done in the public schools of the Territory; but we have found it impracticable to dispense with classes designed to prepare students for the work of the higher classes. This course affords thorough training, as far as it goes, and provides a good foundation for future studies. One of its main objects is to give training in the best methods of study—to teach pupils to think. In many cases students lacking neither in zeal nor ability are at a disadvantage in not knowing how best to direct their energies to the matter in hand. It will be the constant aim of the instructors in the preparatory school to overcome this difficulty, which has been heretofore the most serious hindrance to educational progress.

To each student who completes the studies of the preparatory course a certificate stating that fact will be given, which certificate will entitle the holder to admittance to the higher courses of the university without examination.

THE ARIZONA SCHOOL OF MINES.

In addition to the facilities for general instruction in the arts of mining—metallurgy and assaying—this department of the university is provided with a mill for

working ores in large or small quantities from a few pounds weight to a ton or more. Mill tests can be made by either the small 3-stamp mill or by the large 5-stamp battery. There are rolls for roller crushing, and jigs and Rittinger tables for concentrating ores.

QUALITATIVE EXAMINATIONS.

In order to promote knowledge of the mineral wealth of Arizona and to disseminate accurate information regarding the minerals and rock formations and their distribution, qualitative tests or determinations of the nature of mineral substances not requiring an assay are made gratuitously upon samples sent by mail or delivered to the institution without charge.

QUANTITATIVE DETERMINATIONS.

When quantitative determinations or analyses are required, or when assays showing the quantity and value of a metal or metals are necessary, a charge is made, under the provisions of the Territorial law of March, 1897, regulating the prices or fees to be charged for an assay at the university. These rates are shown in the following schedule:

Assaying ores from Arizona.

Silver and gold, or either	\$0.50
Silver, gold, and copper	1.00
Copper .....	.50
Ores containing more than three common metals	1.50

The following rates have been established by the board of regents for assaying ores taken from deposits or mines without the Territory of Arizona.

Assaying ores from without the limits of Arizona.

Silver and gold, or either alone	\$1.00
Copper	1.00
Lead	1.00
Zinc	2.50
Iron	2.00
Silica	1.50
Alumina	5.00

And for other determinations such rates as the director of the school of mines may, in each instance, fix.

THE TERRITORIAL MUSEUM.

The Arizona legislature, session 1893, passed an act establishing a general museum at the university. The object of this is to collect materials of all kinds illustrating the resources and development of the region, and particularly to preserve historical relics, including those pertaining to the aboriginal inhabitants.

Donations of specimens and collections will be received and acknowledged with thanks, but no provision has yet been made by the legislature for the support of this department, aside from the appropriation of \$100 per annum for the salary of a curator for two years.

A collection has been bequeathed by the late Edward Rose, of Pleasant Valley, Gila County, and the nucleus of additional collections will come from duplicates of the material obtained by members of the faculty in their annual tours of scientific investigation in the Territory. The collection of minerals made by Mr. Sorin at the World's Fair in 1893 is also placed with the foregoing. Historical records of much value are being gradually accumulated as a part of this museum, and an appeal is made to old settlers and others to bear this fact in mind when making disposition of articles bearing even remote relation to the early pioneers and their history. All records and data of any nature which can be gleaned are worthy of preservation, and we earnestly desire to have them placed at the university, where they will always be accessible for reference.

A large and valuable collection of skins of the birds of Arizona has been deposited by Mr. Herbert Brown in the museum.

It is desired to make the collection of ores and minerals fully represent the great mineral resources of Arizona, and specimens from all the mines will be thankfully received and acknowledged.

The agricultural experiment station connected with the university is performing excellent service for the Territory. A detailed statement of the work of the station will be found in connection with this report.

The school of mines is also in successful operation, and its benefits to an important and constantly developing industry are numerous.

A commercial department affords an excellent opportunity for pursuing the commercial branches, such as business arithmetic, bookkeeping, stenography, penmanship, and commercial law, and is designed to prepare students for actual commercial life.

Military science and tactics are taught regularly, and all male students are required to take military drill until the end of the sophomore year. Thereafter the work is optional.

The advantages of this requirement are seen in the improved physical condition of the students and in the orderly deportment which it fosters and enjoins.

An equivalent of time thus occupied is devoted by female students to physical culture, vocal culture, and instruction in the rudiments of hospital practice and the prompt relief of the injured.

Other physical training is found in athletic organizations, which are under the immediate care of a committee of the faculty.

The students maintain a literary society, which is a valuable feature of college life and whose work embraces general literary exercises and practice in parliamentary usages.

The dormitories, though inadequate, afford accommodations for about sixty students. The price of board barely covers the cost, so that students' living expenses need not be excessive. Fifteen dollars per month covers expenses of board, fuel, and lights.

The social life of the college is guarded and fostered. Frequent social entertainments are given under the management of the matrons.

The board of regents is composed of gentlemen who give much time and intelligent and conscientious attention to the duties of their office.

TERRITORIAL NORMAL SCHOOL.

The following statement is made by the principal of the institution:

The legislative enactment providing for the organization of this school, also stated the design and purpose of its establishment to be, "that a normal school for the Territory of Arizona is established at Tempe, in Maricopa County, Ariz., the purpose of which shall be the instruction of persons, both male and female, in the art of teaching, and in all the various branches that pertain to a good common school education; also to give instruction in the mechanical arts and in husbandry and agricultural chemistry, in the fundamental laws of the United States, and what regards the rights and duties of citizens." With the approval of the board of education, after a careful consideration of concomitant conditions, the faculty has, up to the present time, limited the work of this school to the instruction and training of teachers, notwithstanding the fact that the legislature has provided for a much broader field of activity.

LOCATION.

The location of this school at Tempe seems very fortunate. Tempe is situated in the beautiful valley of the Salt River, 7 miles from the capital. It has railroad connection with the Southern Pacific and Santa Fe systems by the Maricopa and Phoenix and Salt River Valley Railroad. The climate here is delightful during the whole of the school year, and the cost of living is less than at any other place in the Territory. The school is in the midst of an intelligent and moral community engaged in farming and fruit raising.

CAMPUS.

The campus includes 20 acres, and is under a high state of cultivation. The north half is set with shade and ornamental trees and shrubs which form a beautiful grove, many of the trees reaching a height of 40 feet. The great variety of plant-life forms found on the campus and on the cultivated and desert lands in the vicinity is a great aid to the students in the study of botany.

BUILDINGS.

The building heretofore used for school purposes was erected in 1886 at a cost of \$6,500. It is a one-story brick structure, 70 feet long and 60 feet wide, with a broad veranda entirely surrounding it, and was a comfortable home for the school the first seven years of its existence.

The new normal school building was completed in the summer of 1897, and has been occupied by the school the past year. It is a commodious structure, 136 feet long, 80 feet wide, and three stories high. The lower story is of brown sandstone,

the other two of red pressed brick with sandstone trimmings. This edifice is beautiful in architectural design, convenient in arrangement, and substantial in construction. Its appointments embrace all the modern school conveniences, such as cloakrooms, closets, recitation rooms, study hall, assembly hall, laboratories, etc. Its fixtures comprise a complete outfit of tables and cases sufficient to accommodate 36 students working at the same time, tablet-arm chairs to seat 160 students, recitation seats for 100 students, tables and chairs to accommodate 40 students in drawing at the same time, besides desks and sittings for 175 students in the normal department proper. In addition to this, the school of practice is furnished with adjustable seats and desks and other modern appliances to accommodate pupils of the several grades to the number of 70. The assembly hall is seated with 400 tablet-arm opera chairs, and will accommodate 500 persons when seated to its full capacity. All things considered, the building is excellently equipped for the purposes of normal school work.

ATTENDANCE.

This school has had a steady, healthy growth from its opening for the reception of students in January, 1886, to the present time. In the first half decade of its existence the attendance increased from 26, in 1886, to 54 in the school year 1890-91.

During the last five years the total enrollment of this school has been as follows: Seventy-six in the scholastic year 1891-92, 87 in 1892-93, 91 in 1893-94, 94 in 1894-95, 134 in 1895-96, 158 in 1896-97, and 173 in 1897-98. This is exclusive of the school of practice department, whose number is limited to 80 in all grades. The greatly increased attendance for the past three years is a good index of the estimation in which the work of this institution is held by the public. Every county in the Territory has been represented by students in this school during the year just closed.

COURSE OF STUDY.

The work of the normal department of this school is laid out in two courses of study and practice—the elementary and the higher. The elementary course has been considerably strengthened during the past two years. It now comprises three years' work as formerly, but requires one year's work more of preparation for admission to it. The higher course has been formulated and will be put in effective operation as soon as available funds will warrant the employment of a sufficient teaching force to do so. It requires four years for its completion and gives better preparation for teaching the higher branches. It carries the academic work through the requirements for admission to the best universities of our country.

Each of these courses requires a year of professional work and practice teaching. These courses also include systematic training in light gymnastics for all students and military drill for the young men. The advantages of such training to the bodily health and carriage of the student is unquestioned. Sufficient training is given along these lines to enable the students to introduce these exercises into the schools in which they may be employed as teachers. It should be borne in mind, however, that the main aim and effort of all the work in the normal school is professional training, that instruction in other lines of the curricula is incidental, but nevertheless necessary, for methods in teaching can not be imparted apart from the subject-matter. For a more minute analysis of the course of study and fuller details of the condition of this school, reference is here made to the annual catalogue published in 1898. These courses have been formulated with a fixed purpose to give the student the greatest possible advantages, the educational status of the Territory and the financial ability of the average student being carefully considered. The scope of these courses of study gives this school a creditable rank with similar institutions in the older communities of our country. The course of study in the school of practice covers the work of the eight grades of the primary and grammar school curricula of the public schools.

In addition, there is much work designed to develop and strengthen the faculties of the child and to render him more self-helpful from day to day and to give added zest to the routine of the school. Nature study is made a prominent feature of this work.

The practice school fits its pupils for the normal department proper, and is open to pupils of school age from any part of the Territory, who are admitted in the order of their application until each grade is filled to its maximum, which has been fixed by the board of education at ten. This department has become so popular that there are always more applicants than can be accommodated.

SCHOLASTIC YEAR.

The school year comprises forty weeks of actual work, divided into four terms of ten weeks each. This subdivision of the calendar gives students who can not attend

school consecutively for a whole year a better opportunity to arrange their work and receive credit therefor toward the quantum, requisite for graduation.

BRANCHES OF STUDY PURSUED.

The academic work during the past year was distributed as follows: Algebra, 74; arithmetic, 81; botany, 61, bookkeeping, 26; chemistry, 19; composition, 72; civics, 25; drawing, 112; elocution, 24; English literature, 68; ethics, 34; political geography, 37; physical geography, 11; geology, 28; geometry, 64; grammar, 48; United States history, 38; music, 95; orthography, 146; general history, 62; physics, 28; physiology, 52; psychology, 68; school law, 40; reading, 42; writing, 48; word analysis, 26; zoology, 21.

The professional work was pursued by the students in classes whose numbers are indicated below: History of education, 21; methods of teaching, 50; observation of critic teacher's work, 25; school management, 18; practice teaching, 23; theses on professional topics, 21.

There were 68 members in the class in military drill and 27 in special work in physical culture. The whole school had training in free gymnastics during the winter months.

LIBRARY.

The library now contains more than seven hundred volumes, comprising works on history, science, education, and general literature. Many of the valuable publications of the Smithsonian Institution, and other publications of the Department of the Interior, are found on its shelves. Appleton's new edition of Johnson's Cyclopaedia, Appleton's Scientific Library, and a few other books have been added to it the current year. It contains a fair supply of reference books for the present needs of the school.

MUSEUM.

The museum already contains many valuable archaeological relics and quite a number of interesting specimens of animals, plants, and minerals characteristic of Arizona, such as copper, silver, gold, and lead ores, native insects, birds, small animals, and plants, and also many specimens from other parts of the world.

The Arizona Antiquarian Association, at its last annual meeting, intrusted to this school the custody of its collection of antiquarian relics, containing the fine collection of Dr. J. Miller, of Prescott, worth several thousand dollars. The museum thus enriched is an important aid to all departments of school work and is freely used by the faculty and student teachers.

FACULTY.

The faculty, the past year, consisted of six members. They are as follows:

James McNaughton, A. M., Ph. D., president, psychology, pedagogy, and mathematics; Laura W. Sharpe, B. E., B. O., language, elocution, and physical culture; Fred M. Irish, B. S., natural sciences; Margaret Graham Hood, director of practice school, methods; Fanny H. Bury, geography, music, drawing, and penmanship; Thomas F. Grindell, history, civics, and literature; Eugene M. Wescott, B. S. (successor to Mr. Grindell, who enlisted in the First Regiment, United States Volunteer Cavalry near the close of the school year).

GRADUATES.

The class graduated this year is the first that has had the advantages of a full course of professional training in the school of practice, the school of practice having been organized a little over one year. Up to the present time eighty-five students have received diplomas of graduation from this school. More than 90 per cent of them have, at some time since graduation, been engaged in teaching. They now form a large and influential part of the teaching force of this Territory.

LECTURES.

In addition to the lectures given by the faculty, a series of entertainments of a high order, mostly lectures, has been given each year. The frequent appearance on the rostrum of prominent people, most of whom favor the students with eloquent and instructive addresses, is a pleasant feature of the school. The school has been favored during the past year with addresses from several of the prominent educated men of this vicinity.

FORMAL OPENING OF THE NEW BUILDING.

On the 4th of February of this year the completion of the new building and its full equipment for occupancy by the school was celebrated by a reception given to

the governor and his staff. After the large concourse of guests were formally received by Governor and Mrs. McCord, assisted by his staff and their wives, very acceptable speeches, appropriate to the occasion, were made by Governor McCord, Secretary McClintock, General Frazier, and Hon. H. Z. Zuck, after which all partook of an elegant repast prepared for the guests by the ladies of Tempe. The occasion gave hundreds of people an excellent opportunity to become acquainted with the appointments of the school and to meet their chief executive and his staff, and also the faculty of the school. Much good is expected from this social meeting.

LITERARY SOCIETIES.

Early in the history of this school, the Zetetic Literary Society was formed; in the autumn of 1895, the Hesperian Literary Society was organized, and early in the past school year the needs of the students led to the formation of a third society—the Websterian. All three have been doing creditable work as their public exercises last commencement week demonstrated.

RAILROAD TRANSPORTATION.

All the railroads doing business in this Territory have granted to the students of this school half-fare rates between their homes and Tempe, except the main line of the Santa Fe system, running across the northern part of this Territory, the present management of this railroad having rescinded the arrangement formerly existing.

GOVERNMENT.

The governmental policy of this school is self-government. It is the only form of government capable of producing that safe and self-reliant character so desirable in the teacher. While it is the constant aim of the faculty to create and foster a wholesome sentiment, it is not its province to retain students willfully or persistently refractory. Those who, knowing the right, refuse to follow it, will be considered unworthy to become teachers and will be unhesitatingly dismissed.

The morale of the school is excellent; no cases of dismissal have occurred during my connection with the school, and in but few instances has reproof been necessary. There has been from the first an increasing interest and enthusiasm among the students in the work of the school, which make their school work especially profitable to them and a source of constant delight to the faculty.

RELATIONS TO OTHER SCHOOLS.

The relations of this school with other similar institutions are very satisfactory. Full credit is given in the California normal schools for work done in this school, and vice versa.

EXPENSES.

The small cost of living at Tempe is a great aid to students of limited financial resources. Board can be obtained in good families at from \$15 to \$20 a month, and in clubs for much less. By hiring rooms and doing their cooking, students are able to make the cost of living closely conform to the expenditures which they desire to make.

CLOSING EXERCISES.

The exercises of commencement week are now looked forward to with great and increasing interest by the people of this portion of the Territory. The year just closed they comprised baccalaureate services, class-day exercises, literary-society exercises, commencement, the alumni banquet, and five class banquets. All of the literary exercises were of a high order, and the social gatherings very enjoyable. More than 1,500 people were present at the commencement exercises, which consisted of an exhibition of literary work, music, and physical culture by the students; and of able addresses by the governor, president of the university, president of the board of education, and others.

LABOR.

This question has never materially disturbed affairs in Arizona. Temporary strikes have in a few instances occurred upon the great transportation lines, but they have seldom been serious in their nature, and have with one exception been quickly settled. Arizona is excep-

tionally free from contention caused by disagreements between capital and labor. Liberal wages are paid and labor is usually contented. Americans are principally employed. There are very few foreigners in the Territory not naturalized. A few Mexicans and some Indians work as section hands on railroads, but a very large percentage of our labor is American.

INDIANS.

It is impossible to give the exact number of Indians within the Territory, as no complete census of them has been taken during the past year. From a partial census taken by the various Indian agents, and their estimates as to those not included in the census, the following is a very close approximate to the number of Indians now in Arizona:

Colorado River Agency:	
Mohaves at agency	683
Mohaves at Needles, Cal.	700
Mohaves near Fort Mohave, Ariz	700
Chemahuavis	141
Total	2,224
Navajo Agency:	
Navajoes	22,500
Moqui Pueblos	2,641
Total	25,141
Hualapai Agency:	
Hualapais	634
Yavasupais	261
Total	895
Pima Agency:	
Pimas (Gila Reservation)	3,723
Maricopas (Gila Reservation)	203
Maricopas (Salt River Reservation)	93
Pimas (Salt River Reservation)	543
Papagoes (Gila Bend Reservation)	75
Papagoes (nomadic)	1,800
Papagoes (San Xavier)	517
Papagoes (Peerless Well)	246
Total	7,200
San Carlos Agency:	
Coyotero Apache	612
San Carlos Apache	1,135
Tonto Apache	856
White Mountain Apache	1,739
Mohave Apache	501
Yuma Apache	51
Suppais, unattached in Navajo County	215
Total	5,109
Grand total	40,569

There have been no outbreaks nor depredations by Indians within the year and it is not anticipated that any are likely to occur. Those who have heretofore been most troublesome—the various branches of the Apache family—have now been peaceful for a longer continuous term than ever before in their history. A few renegades, not exceeding five, have been supposed to be in hiding in the Sierra Madre Mountains of Mexico for several years, although nothing has been heard from

them for a long time. No positive evidence exists as to where they are, and it seems to be generally accepted that they are either dead or gone where they are no longer a menace to the safety of our citizens. A railroad has been constructed across the San Carlos Reservation within the year which, in my judgment, will be very potent as a civilizer.

There has been some little friction between the Navajoes and whites in northern Arizona over the settlement of lands and the possession of watering places, but nothing serious has resulted, and I am informed that an amicable adjustment is being had whereby the rights of the Indian, as well as the white man, will be properly recognized. I deem the question of the future of the Navajo Indians the most important that confronts the Indian Bureau. The tribe is increasing in population, while there is not sufficient water and productive land within the limits of their reservation for their use.

Under the terms of their treaty with the Government they are required to remain within the limits of the reservation, except when hunting, under certain conditions, etc. If the treaty is enforced it will undoubtedly work a hardship upon the Indians; if not enforced there is always likely to be more or less friction between them and white settlers and occupants of the public domain, and those in possession of springs and watering places long distances away from the reservation, but which were used by the Indians for many years prior to the execution of the treaty. How to arrange this matter justly and properly care for these wards of the Government I consider a very serious question. The Navajoes are powerful, well armed, and comparatively well supplied with cattle, horses, and sheep, and if they should become warlike it would take a large force a long time to subdue them.

The Indian schools throughout the Territory are very prosperous, as the following report will show:

PHOENIX INDIAN SCHOOL.

Following is a report on the affairs of the Phoenix Indian Industrial Training School for the past year by the superintendent of the institution:

This school has grown during the year from 250 to 450, the average for the year being 418 and the enrollment 480, composed of the following-named tribes, viz:

Tribe.	Old pupils.		New pupils.		Total.		Grand total.
	Male.	Female.	Male.	Female.	Male.	Female.	
Arizona:							
Pima.....	109	140	41	12	150	152	299
Maricopa.....	28	20	3	2	31	22	54
Papago.....			52	20	52	20	72
Apache.....			6		6		6
Mojave.....			1	1	1	1	2
New Mexico:							
Pueblo.....			14	5	14	5	19
Navajo.....			6	3	6	3	9
Oregon:							
Rogue River.....			1	2	1	2	3
California:							
Ukiah.....			4		4		4
Uki.....			2		2		2
Little Lake.....			4		4		4
Nunkie.....				2		2	2
Can Cow.....				1		1	1
Total.....	137	160	135	48	272	208	480

The good results obtained from introducing advanced pupils from other tribes were immediate and decided. This innovation caused the Pima Indians much

uneasiness at first. They had fostered the idea that this school was theirs by divine right and in fee simple. They resented foreign intrusion and glowered at the newcomers. Some ran away. After awhile, however, as friendships were formed, false conceptions were banished, clans were broken up, cordiality returned, and peace and good-fellowship reigned. The intermingling of different tongues is the surest and best way to teach English and broaden the tribal view.

The year has been one of progress. The school has been a veritable beehive of industry. Enthusiasm glowed in every heart and shone on every face. The hum and song of the tools of industry were heard on every hand. All the various trades usually taught at schools of class 2 have been energetically carried on. Besides these our boys have molded, manufactured, and burned nearly 1,000,000 fine brick, doing the work entirely themselves after the first kiln had been burned. With these brick we have built a fine large barn, a bakery, boiler house, bath house with plunge bath annex, our boys being taught the trade of bricklaying and doing all the work on the plunge bath.

Some 300,000 brick have been sold to the contractors of the new buildings. These buildings consist of a two-story stone and brick school building of twelve rooms and assembly hall, with steam heat, slate blackboards, electric bells, and all modern improvements; a two-story stone and brick building with basement, to be occupied by cold storage, mess kitchen and dining hall, children's kitchen and dining hall, and teachers' quarters; a two-story shop building for use of tailor, harness maker, shoemaker, carpenter, blacksmith, and wagon maker.

We are vigorously kicking ourselves free of our swaddling clothes and blooming into masterful manhood. For the fiscal year 1899 we have appropriations for 600 pupils—thus making us the second school in the service in size—for water and sewerage systems and a large dormitory.

The literary and industrial work have gone hand in hand. They are the Siamese twins of education. The theory learned in the class room is exemplified in the workshop. Indolence is the cankerworm of progress; so our pupils are taught to kill the worm. The various literary teachers are required to visit the industrial teachers often enough to keep familiar with the work; then the arithmetic, the history, the geography, are used to elucidate and illumine dull labor. Thus do we maintain the proper correlation between the literary and industrial. A head full of theory is a despicable piece of vainglorious sounding brass, only a little more to be despised than cunning hands yoked to a fool; but when the head and hands are working in harmony then we have a jolly team of irresistible forces.

We pride ourselves on being a working school. No child is permitted to work as he pleases. "Putting in time" is not sufficient. The child is taught how to do a thing, when to do it, and to do it whether he wants to or not. More than this, he is taught to do it with as much skill and speed as any other person could.

After all, it is not the size of the buildings, beauty of locality, nor the size of its appropriations that make the great school. The secret does not lie even in the fame of its instructors, their degrees, or what they have published. The real secret of the success of any school lies in its employees as a corps, and the nearer these teachers are to simple humanity—Christ-like humanity—the grander and more enduring the success. In teaching Indians especially the teacher must not soar; he must creep and grope. To free him from his prejudices the teacher must use great diplomacy, for the searching after truth is more valuable than the truth for which we search. Our employees have been exemplary examples of right living.

The health of pupils during the year has been most excellent.

With one exception this school possesses the finest opportunities in the service for profiting by the so-called "outing system." Arizona is populated by the best of people—people of refinement and means who have come seeking for health or business openings. There is a demand for 500 of our pupils within 10 miles of the school. This practical home training gives the pupil precisely the training he required. The wages paid range from \$6 to \$20 per month.

Owing to the miserable policy of filling this great institution with raw material from the near-by reservations each year, it has been impossible to anywhere meet this demand for our pupils. These pupils are usually small and are absolutely ignorant and inexperienced. The school has been more of a nursery than the training school it should be. This school in the future will be filled with advanced pupils transferred from other schools; then the splendid opportunities in the way of trades and "outings" will be utilized. During the year about 150 pupils have taken advantage of the "outing system," thus accumulating practical knowledge of modern housekeeping, individual thinking, and planning, thus establishing character and independence, besides some hundreds of dollars in cash. The expenditure of the money earned is supervised by the matron, who keeps accounts and helps the girls to save.

Another point in connection with our school: Every year our Eastern and Northern schools are obliged to return many pupils to their homes owing to the development,

in their cold climate, of the child's inherent lung diseases. These children are thus deprived forever of all mental and moral development. Nondevelopment is no hardship to the camp child, who is satisfied because she knows of nothing better. But to the child whose faculties have been fertilized with the pollen of quickened thought, whose eyes have beheld the Canaan of knowledge, whose soul has awakened to a grasp of the infinite, the sudden blighting of all her fond hopes, ambitions, and yearnings is the modern Inquisition. Such keen disappointments kill.

Instead of sending the child home, why not send her to the Phoenix School? This climate will not create new lungs, but it will heal the organ if there is anything left to heal. The child may then finish her studies while the body is healing.

The location of the Phoenix School is most admirable for valuable practical instruction in two very important industries, viz: Farming by irrigation and mining. In all the vast region west of the Rockies these two industries are paramount. Agriculture and horticulture in this vast region and the region east of the Rockies have few elements in common. Our farming is all subject to irrigation; therefore a knowledge of the kind of soil, its elements, porosity, etc., is required in order to know how to irrigate. Then our crops are different in kind. This is especially true of our fruits. Yet our Indian children are sent to Haskell and Carlisle (both most excellent schools) to learn how to farm.

All the principles which apply to successful farming by irrigation are taught here, and it is truly surprising how eager the boys are to acquire this knowledge and how quickly they apply it on their home farms. Besides the farming proper, we give thorough instruction in dairying, flower and fruit culture.

We hope this year to be able to start our mining department. The Indian is the natural prospector. His nature, love of outdoor life, habits, powers of endurance, and knowledge of the country all combine to make this his ideal vocation. Given the proper knowledge of mineral geology, values of ores, and how to work his mining properties, and there is no reason why he should not be an important factor in wealth production, and in a way, too, that does not bring him into direct competition with thousands of equally deserving but less fortunate white people.

It does seem to me to be far wiser to give an Indian the kind of knowledge that will help him develop his natural resources than to push him, half ripe, into positions created for him. By providing places as teachers and clerks for the Indian youth, by paying them salaries largely in excess of what they could earn in outside labor markets, and by favoring them to the extent of admitting them to these positions simply because of color, while other races are subject to crucial examinations, we simply foster the deplorable policy of governmental paternalism.

This school is located in the beautiful Salt River Valley, which is surrounded by mineral-bearing mountains. Gold, silver, copper, lead, granite, sandstone, onyx, etc., are found in abundance within 100 miles. Many of these are also found on every reservation throughout the West. They lie untouched, valueless, while thousands starve because of the Indian's ignorance. The Indian builds his shack on a million-dollar hill, while the white men beg for work and women for bread.

The Indian should be taught to help himself, then to help others; thrift and benevolence, not idleness and greed.

I hope to soon teach the theory and practice of mining in all its branches.

Music forms a very large and important part of our school instruction, we considering it an invaluable aid to mental and moral activity and development. Our band is highly appreciated and much sought after. Our orchestra astonishes those who think there is no music in the Indian. The choir and girls drum corps are pleasant and profitable features.

PUBLIC BUILDINGS.

The completed public buildings of Arizona consist of the Territorial prison, situated at Yuma; the Territorial university, at Tucson; the insane asylum, at Phoenix, and the normal school, at Tempe, all of which have been erected at Territorial expense. Not one dollar has ever been appropriated by Congress for the erection of public buildings in Arizona. The nineteenth Territorial legislature passed an act authorizing an issue of Territorial bonds amounting, at their face value, to \$100,000, for the purpose of erecting a capitol building, which act was ratified by Congress. The bonds have been sold and the construction of the building, as authorized by law, will be commenced without delay.

A building known as the Territorial Reform School Building, situated at Flagstaff, has been partially completed. The building will be fin-

ished within the year and will probably be used for normal-school purposes, as there are no vicious youth in the Territory in duress, and therefore no reformatory is needed.

ARID LAND.

The question of disposition of or suitable legislation for the reclamation of the arid lands of the West is constantly recurring in Congress, and many theories have been advanced and plans suggested, but so far no defined policy has been adopted. Large appropriations have been sought to carry out theoretical plans for reclamation, but so far it has been impossible to even get these lands surveyed. Arizona is very deeply interested in the subject. As before stated, the greater part of the arid land of Arizona is very favorably located for reclamation. Reservoir sites on the Salt and Verde Rivers, upon the Gila and Agua Fria, Santa Cruz, Little Colorado, Hassayampa, and several other smaller streams, present the very best advantages for the storage of water enough to reclaim an area of country larger in extent than several of the New England States. The water supply is ample and only needs conservation. Private enterprise would no doubt build many reservoirs and canals if the lands belonged to the Territory and were available.

I earnestly recommend that the arid lands of Arizona be ceded to the Territory, and the necessity of further legislation by Congress on the subject thereby relieved.

If it were possible to secure sufficient financial help from the General Government, to be expended under suitable regulations, to build canals and reservoirs for the reclamation of the arid lands of the West, and thereby rapidly develop and populate the now unoccupied and unproductive sections, I would earnestly favor such a plan; but experience has taught us that Congress will not appropriate large sums of money for such a purpose, and the constituents of the members of Congress from the East and Middle West do not want their Representatives to appropriate money for which they will be taxed to bring into competition with them large areas of new farm lands; besides, any system which could with propriety be adopted under the usual governmental restrictions would be cumbersome and difficult of operation. I am therefore firmly of the opinion that the quickest, best, and most satisfactory way to secure the reclamation and occupancy of the arid portions of the country is to cede the lands to the States and Territories in which they lie, so that the question of disposition and development may be one for local legislation.

HEALTH AND SANITARY CONDITIONS.

Following is a report by the surgeon-general on the health and sanitary conditions of the Territory:

It is a fact beyond contradiction that Arizona has the most healthful climate under the Government of the United States; more, it has the greatest variety of climates within the same radius of any country, State, or Territory in the world, the altitudes ranging as they do within comparatively a few miles from sea level to some of the highest mountain peaks. Fortunately we have cities and towns of sufficient size to secure to the inhabitant all of the usual luxuries at almost any altitude desired. What is said of altitude can as truthfully be said of temperature. During the summer months it is but a question of four or five hours on a Pullman from a hot (110° in the shade), dry climate to the most delightfully cool mountain air to be found anywhere—where during the hottest of summer days the thermometer does not show a higher temperature than is found in our valleys in midwinter. In

midwinter one can leave the high altitudes, where the snow is from 2 to 6 feet deep and the mercury anywhere below zero, and in a few hours find himself in the valley where it is perpetual summer.

What is said of altitudes and temperature can also be said of rains, except that there are very few places where there is much humidity; as a rule, the greater the elevation the more frequent the rains. There are certain portions being practically without rain, and others where it rains more or less nearly every day. That Arizona ranks first as having a health-giving and health-restoring climate is rapidly becoming generally known throughout civilization; and as a result our inhabitants are made up of citizens from every country and State in the world, who have come here mostly not because it is easy of access nor because of its financial or political inducements, but because of the health-giving sunshine and enjoyable temperatures which lengthen and make more happy the lives of all who come. It is unfortunate for our records of mortality that quite a portion of our visitors are afflicted with incurable diseases, having lived in other countries as long as it was possible, only coming to Arizona as a last resort. Every invalid added to our population who afterwards dies adds a percentage to our mortality records and takes a percentage from the records of the place whence he came. This fact makes it very difficult to approximate from the records anything like a true comparison of Arizona with other States or countries as to the healthfulness of its climate. A better idea of the value of our climate is obtained from observation than from records—taking the same class of invalids here and at other places, observing their condition and progress in comparison. Yet the records are very valuable, containing, as they do, many unexpected and instructive facts, attention to which is called below.

Diseases of the lungs, nose, throat, and kidneys do particularly well in all parts of the Territory. It is customary for nearly all who visit us in search of health during the winter months to go to those cities located in the lower altitudes, i. e., Phoenix, Tucson, Yuma, and others, remaining there until the heat of the summer, when they either go back to their homes in the East or to some of the Arizona cities of higher altitude, i. e., Prescott, Flagstaff, Williams, or others. Many go to the mountains to rough it or to the smaller places, of which many are found throughout the different mountain ranges of Arizona. There is a grave question as to the advisability of this course. Observation has taught those who have lived in the lower altitudes that all lung, throat, and nose troubles do much better in the dry heat of summer than during the winter months. It is not uncommon to hear physicians say that they "consider the climate of Phoenix and other Arizona points of low altitude to be the least harmful winter climate known, but the summer is the time to get well." Kidney troubles do best where they can be given the most rest; the high temperature produces an excessive perspiration, thus the skin performs much of the labor which would otherwise have to be performed by the kidneys, hence the low altitudes are far preferable for this class of diseases, and the summer better than the winter.

The records kept by the health commissioner of the city of Phoenix demonstrate the fact that consumption is practically unknown among those who are native to this climate. The said records show that there were 111 deaths from tuberculosis during the past year, and that but 1 of this 111 was a native-born white, while the records show that in addition to this one native white there were 3 Mexicans who also died of consumption. There are reasons for doubting the statement that these Mexicans died of tuberculosis, as there is no probability that there was any microscopical examination made, hence no positive diagnosis.

The said records show that there were but 33 deaths from all causes among the Mexican population, and that 10 of those were from pneumonia. It is more than probable that where so large a percentage of deaths was due to pneumonia, that the three deaths charged to consumption were in fact due to chronic pneumonia, pleurisy, abscess of, or other chronic lung affections. Although the percentage of deaths from pneumonia among the Mexican population is high as compared with deaths from other causes, it is very small when compared with the number of that class of inhabitants. The poverty and careless habits of this class of people subject them constantly to the greatest exposure possible in this climate.

The percentage of deaths from pneumonia is very small among the white population, there being but 6 deaths from this cause out of a total of 248 deaths from all causes. These six deaths were mostly, if not all, due to pneumonia occurring in visitors who came here seeking relief from tuberculosis in its advanced stages. As a rule they come from the cold and snow of the North and East to our beautiful valley, where they find what to them seems summer weather; the air is warm and dry, the brightest of sunshine, and the ground and trees covered with verdure; it is hard for them to realize that this is winter weather. They are apt to make the error of taking no more precaution as to taking cold than they have been in the habit of doing in their homes when the weather was as warm; the result is, only too often, they catch cold and have pneumonia. It is wonderful that more of these sick and careless people do not die from this cause. The presence or absence of typhoid fever

is a question among the physicians of the Salt River Valley, a number of them contending that there is none, others claiming that there is. We have a fever in the valley which resembles somewhat typhoid fever, which is held by many to be caused by the long-continued high temperature with an unusual exposure and overheating of the body.

In favor of their claim is the fact that many of these cases recover like magic if taken to the higher and cooler altitudes. We had but six deaths ascribed to typhoid fever during the year. Three of these are known to have been due to other causes, and not to typhoid fever or any of its effects. Eliminating these three cases leaves but one white and two Mexicans who are supposed to have died of this disease. When we take into consideration the fact that the Mexican population live upon the banks of the irrigating ditches largely, that they are exceedingly careless as to cleanliness, that the water running in these ditches must of necessity become contaminated with the dejections of these citizens, that they use this same ditch water for drinking and cooking purposes, that the records show but two deaths from typhoid fever among this class of people, and that one of those was not certified to by a physician, as there was no physician in attendance, it at least looks as though those physicians who claim there is no typhoid fever in this valley have good grounds for their opinion, for should we have one case of typhoid fever located so that the water in the irrigating ditch or ditches should become contaminated, instead of two deaths from this cause during a year we would expect to have a number of hundred.

Our valley climate is probably the best in the world for children, there not being a single death from scarlet fever, measles, whooping cough, nor diphtheria. This is most wonderful when one realizes that we have a large Mexican population, where the surroundings are as bad from a health standpoint as it is possible to conceive, from two to twenty living in a single small one or two roomed adobe house, sleeping on the ground, with practically no attention paid to cleanliness or changes in temperature.

A number of Salt River Valley physicians have volunteered the information that they have never seen a case of cholera infantum or dysentery. Considering our long, hot summers, this seems marvelous to those who have lived in humid climates, where the undertakers are kept busy during the heated portion of the year burying children who have died of these diseases.

Attention is called to the fact that the United States Census Bureau places the whole of Arizona on a par with the most of the Southern States as to the presence of malaria. This is most certainly an injustice, as the health commissioner's records show but one death in two years from malaria, and that was in the person of a Mexican 60 years of age, who undoubtedly brought the disease with him from Mexico. The writer has not seen a single case of malaria in any of its forms, imported or domestic, in the Territory.

A few words as to the temperature. It is true we have a prolonged period of high temperature during the summer months. But it is also true that this high temperature is not felt by the individual anything like what the same temperature would be felt in the East. In other words, there is a great difference between thermometer readings and the individual feelings. This difference is due, in part at least, to evaporation. In the more heated portions of Arizona we have but slight humidity, whereas in the East the humidity is great. With the increase of atmospheric temperature the body perspires, the perspiration is evaporated with sufficient rapidity oftentimes to produce a chill to the body. A person will many times, when leaving the still air of an office and getting into a carriage and driving in the hot sun, with the temperature between 130° and 140° (in the sun), with the thinnest of clothing on, feel a sensation of chilliness due to the effect of the rapid evaporation of the perspiration. Yet the air that produced this sensation came right off of our sun-baked desert, and when taken into the lungs felt as though it was from the mouth of a furnace.

Attention is called to the following from the United States Weather Bureau:

SENSIBLE TEMPERATURE.

"The mean of the daily maximum temperatures at Parker, Yuma County (elevation 375 feet), for the month of May was 103°. But the mean of the daily minimum temperatures for the same month was only 59°, making a mean for the month of 81°, which is not an uncomfortable degree of heat in this climate, owing to the effect of humidity upon temperature sensation.

"Unfortunately, there are but few stations in the Territory where wet-bulb readings are taken, and Parker is not one of them. But Yuma, a station very similarly situated, is supplied with the necessary instruments for determining the relative humidity. The mean of the dry-bulb thermometer readings at Yuma during May was 80.4° and the mean of the wet bulb at the same place during the same period was 60°.

"That the degree of temperature expressed by the reading of the dry-bulb thermometer is greater than the sensible temperature whenever there is a difference between the dry and wet bulb thermometer readings is generally conceded. But just what fraction of the difference between the dry and wet bulb thermometer readings should be taken to denote the degree of temperature felt has not been determined, and from the nature of the question, since it involves consideration of the health, clothing worn, cleanliness of person, etc., of the individual experimented upon, a combination of conditions that can not be exactly the same in any two, let alone all persons, never can be more than approximated.

"After considerable study of the subject as enunciated in the writings and discussions of others, and from a personal experience acquired during several years' service in the Weather Bureau in localities differing radically in temperature and moisture, the writer's conclusion is that three-fifths of the difference between the dry and wet bulb thermometer readings, deducted from the reading of the dry bulb, expresses approximately the degree of temperature felt by the average person.

COMPARISON OF TEMPERATURE.

"Adopting the foregoing assumption, we are prepared to compare the temperatures—as published in the Monthly Weather Review—at one place with that of another, that of Arizona with that of the States in the Mississippi Valley, or that at Phoenix with that at St. Louis. Thus, the mean dry-bulb thermometer readings at St. Louis for August, 1897, was 76.8° ; the mean of the wet-bulb readings was 66° ; difference, 10.8° , which, according to the above hypothesis, would give the sensible temperature 70.3° . The mean dry-bulb temperature at Phoenix for the same period was 89.2° ; the mean of the wet-bulb readings was 70° ; difference, 19.2° , and the sensible temperature 77.7° , or a difference in the temperature as it is felt at the two places by the average person of 7.4° , instead of 12.4° as shown by the usual method of comparing temperatures, i. e., without taking into consideration the evaporating and consequently cooling capacity of the air at one place as compared with that at the other." Or, as published in the daily bulletins of the Weather Bureau, thus:

"On November 17 the dry-bulb temperature at Phoenix at 8 a. m. was 52° , the wet bulb 42° ; difference 10° , and the sensible temperature 46° ; at St. Louis, on the same date and at the same time, the dry-bulb temperature was 30° , the wet bulb 28° , and the sensible temperature 28.8° . In other words, the mean 'sensible' at Phoenix during one of the hottest months of the year was only 7.4° higher than the mean sensible temperature at St. Louis during the same month. And the sensible temperature, as determined from observations taken at the same hour, on the same day, of the last month of autumn, was at Phoenix 14° above freezing and at St. Louis 3° below the freezing point."

As is seen from the above, the Weather Bureau places the sensible temperature at three-fifths of the difference between the wet and dry bulb thermometer readings. This may be so, and undoubtedly is, but there is no question but that there is a much greater difference than would be represented by the total difference between the wet and dry bulb readings in the effect of the temperature upon both man and beast. For instance, sunstroke is practically unknown in Arizona, although a larger proportion of the population of the most heated portions have to perform the most severe manual labor in the open fields, where the thermometer is reading from 115° to 120° in the shade, while in New York, Chicago, or St. Louis, when the temperature is over 90° , it is almost an everyday occurrence to not only have sunstrokes, but many deaths therefrom. What is said of men is equally true of animals.

MILITIA.

Report of the adjutant-general on the condition of the National Guard of Arizona during the past year:

The National Guard of Arizona consists of one regiment of infantry, composed of ten companies, divided into two battalions of four companies each, and one battalion of two companies.

This division of the regiment works harmoniously and is productive of increased administrative and disciplinary efficiency.

During the past year no event has occurred in the Territory calling for the services of the Guard. The officers and men of the National Guard of Arizona are imbued with praiseworthy enthusiasm in the work of promoting the efficiency of the Guard, and have by commendable pride, military bearing, and excellent discipline justified the confidence of the people.

From the annual appropriation of Congress to provide arms and equipment for the militia this Territory will receive this year \$2,308.06, an amount totally inadequate

for the needs of the Guard. I earnestly recommend that, if practicable, the allotment to this Territory be increased to at least \$4,000 per annum.

There are many matters connected with the Guard which require legislative action looking toward improvement in organization, administration, and equipment, which it is my intention to present for consideration in the near future. I deem it best, however, at this time to proceed in the upbuilding of the Guard in a conservative manner and upon lines which shall have for an objective the development of the Guard into a most effective and efficient force.

Capt. John A. Baldwin, Ninth Infantry, United States Army, has been on duty with the National Guard of Arizona for the past year and has performed his duties as instructor and inspecting officer in a most satisfactory manner, and his presence with the Guard has been of great value to officers and men.

The present foreign war, while demonstrating the nation's indomitable energy and unlimited resources for armed conflict, has shown our lack of preparation at the first note of warning. Actual experience has taught and emphasized the necessity of remodeling our military system. To the truths made apparent by the present war our people are alive. A most generous and patriotic support of the National Guard from our next Territorial legislature is anticipated.

The "Rough Riders," who on Cuban soil made an imperishable name for themselves and for Arizona, are of the same material that compose our National Guard. I regret that no data is at present obtainable from which to give the number of National Guardsmen who enlisted in the "Rough Riders" from this Territory. I understand, however, that there were quite a number.

It is with pride that I record the fact that that chivalrous and heroic soldier, Capt. William O. O'Neill, was at one time adjutant-general of this Territory. By reason of having performed the requisite number of years' service in the National Guard of Arizona, his name, at the time of his deplorable death, was borne on the roll of "National Guard veterans." He was the first volunteer to be mustered into the service of the United States for this war.

Maj. Alex. O. Brodie, of the First United States Volunteer Cavalry, whose bearing in front of Santiago commands all men's admiration, was the former colonel of the First Regiment of Infantry, N. G. A.

It is with pleasure that I invite attention to the fact that of the nine line officers commissioned in the Arizona, New Mexico, Oklahoma, and Indian Territory United States Volunteer Infantry six of them were at the time commissioned officers in the National Guard of Arizona. For this regiment the National Guard of Arizona furnished a considerable number of men, who at the time were active members of the Guard. Many others enlisting in that regiment had been former members of the Guard.

These facts are more forcible than language. While the National Guard is primarily organized as a force for service in maintaining the laws of the Territory and repelling Indian outbreaks, should it ever become necessary, yet it must ever be through the National Guard that our citizens receive the military training and education which will fit them to respond to the nation's call.

It is pertinent to invite attention to the fact that the National Guard of Arizona is a moral force of incalculable value, aiding and assisting as a conservator of law and order the development of the great resources of the Territory and thus giving confidence for the investment of capital.

The changes in the various companies of the National Guard consequent upon many officers and men volunteering for services in the United States forces have in no way stemmed the interest of those who have remained. The places of those who volunteered have been rapidly filled by others, and forward footsteps in the march of progress of the Guard have in no wise been stayed. It has been a matter of regret that the entire National Guard of the Territory has not been called into the service of the United States. Had this been done it is a safe assertion that 90 per cent of the men would have responded.

As indicating the superior physique of our people, only 20 per cent of those who applied for enlistment in the volunteers from this Territory were rejected for all causes, notwithstanding that the most severe and rigid physical examination was made by the United States mustering officer—a percentage that was less than that in any other State or Territory in the United States, and which bespeaks the moral stamina and physical worth of our people who gave to the nation a magnificent body of men.

In the present war Arizona furnished 7 officers and 200 men for the "Rough Riders," and 12 officers and 334 men for a regiment formed from the Territories and known as the "Arizona, New Mexico, Oklahoma, and Indian Territory United States Volunteer Infantry," making a grand total of 542 officers and men.

Considering these facts in connection with our population of less than 100,000, Arizona has occasion to feel a just pride.

The strength of the National Guard of Arizona, according to the last returns in

this office, show that there are on the governor's staff, 6 general staff officers and 4 aids-de-camp, and in the First Infantry, 44 officers and 489 men—a grand total of 544 officers and men.

ETHNOLOGY AND ARCHÆOLOGY.

Arizona presents far more profitable and interesting fields for the scientist and ethnological explorer than any other part of the country. Evidences of a large population, now lost to history, or even tradition, exist in many localities; ruins of immense buildings and of cities which once were occupied by hundreds of thousands of people; prehistoric waterways, etc., furnish good reason for the belief that quite a high state of civilization had been reached by these people who are gone, and whose record is lost. There is also much to be learned of the living, especially the Moquis, Zuñis, and other pueblo Indians of northeastern Arizona. Similarities of language are declared to exist between these people and the Asiatic races. The art of mummifying is unquestionably known to the Moqui priests. Hieroglyphics are found in all respects like those of Egypt, and within the inner circles of Moqui secrecy I am reliably informed that Masonic signs are inscribed upon the emblems and insignia of the priests. All this is strange and interesting and deserves most searching investigation. I believe that startling discoveries can and will be made here affecting the history of the human race, and I strongly recommend that an ethnological commission be appointed, to consist of the ablest scientists whose services can be obtained by the Government, for the purpose of thorough, careful, and extended ethnological and archæological research in this section of the country. Liberal appropriation should be made to defray the expenses of the commission, and ample time should be given, possibly extending over a number of years, for the prosecution of the work. I am positive that the knowledge gained by such action would more than justify the expenditure. I think it will be more productive to science to explore and excavate here than in foreign countries.

WHIPPLE BARRACKS.

At the outbreak of the late war what was practically an order of abandonment of this important military post was issued, the troops withdrawn for service elsewhere, and a large amount of valuable Government property sold for nominal prices.

I believe it was a mistake to abandon the post, and that it should be reestablished and improved. I do not believe any better locality can be found in the West for a military garrison. I consider it an important factor, also, in maintaining law and order, advancing the welfare and civilization of a very large scope of country; and in support of my position I cite the following letter of Gen. E. T. Otis, who commanded the Department of the Colorado, which letter was written after a careful personal inspection of the post:

HEADQUARTERS DEPARTMENT OF THE COLORADO,
December 15, 1897.

SIR: Concerning telegram of the 10th instant wherein request was made that final action on the question of abandonment of Whipple Barracks be deferred, I have the honor to report that it was sent as rumors were in circulation signifying such intention by the Department of War, and because I desire to submit before any final action should be taken an opinion on the advisability of carrying out such a measure, believing that the abandonment of the post at this time would not be in consonance with the public interests.

* * * * *

Every one of the department posts herein named excepting Whipple Barracks is practically distant from railway transportation from two to five days, for those of them which are located very near to railway lines communicate only with insignificant stations, where rolling stock for the transportation of troops could not be secured in much less time than is expressed above, even with open railway and telegraphic communication. Besides, not one of them is situated near to extended business enterprises, or in sections which are being rapidly developed or show late increase in white population.

Whipple Barracks, on the contrary, is at the center of population and of the business interests of Arizona. It occupies an important railroad point and stands unsupported within a large section of country between the chain of posts along the eastern portion of that Territory and the Pacific coast. Its garrison is in quick railway communication with the trunk lines of the Santa Fe system 60 miles to the north at Ash Fork, distant from San Diego and San Francisco 570 and 800 miles, respectively, and with the Southern Pacific Railway at Maricopa, which is some 500 miles from the seacoast. On account of its railroad facilities it is practically nearer to Flagstaff and Holbrook than either Wingate or Fort Apache, and to Tucson than either Fort Grant or Huachuca. It is contiguous to the agricultural portions of Arizona, and in the midst of its growing and turbulent mining camps. It may be speedily moved for the protection of white inhabitants along the Verde and Gila rivers and the Date and Salt Creek valleys in case a raid is threatened by the White Mountain and San Carlos Apaches (of which those inhabitants professed fear during the past year), or by any of the 4,000 other Indians within the southwestern section of the Territory. Strategically, therefore, considering present indications, and mindful of the employment of the army during the last twenty years to aid the civil authorities in the enforcement of the law, it appears to me that Whipple Barracks has a present and future importance which no other post in Arizona or New Mexico possesses.

The abandonment of Whipple Barracks has been recommended and urged not only on the rumored theory that troop occupation in that section of the country is unnecessary, but for further reasons that the location of the post is unhealthy; that its grounds are inadequate; that its buildings inconveniently placed, were poorly constructed, were in a decayed, dilapidated, and unsanitary condition; that its water is impure, and that its water and sewer systems are obsolete in character, in a wretched state of repair, and are dangerous to the health of the garrison.

The post, established in 1863, is about a mile to the eastward of and overlooks the city of Prescott. Most of the present buildings were constructed nine or ten years thereafter, and were intended to accommodate the troop of cavalry and four companies of infantry. In addition, the buildings were erected for the headquarters of the Department of Arizona. Nearly all of the buildings are of cheap construction, after plans prevailing at frontier posts during that period. A notable exception is a very large set of quarters now used for the headquarters of the regiment and post, and the former department headquarters structure of large size, with commodious and well-equipped outbuildings, which at present gives ample room and conveniences for the regimental band and the company of infantry.

The garrison has been reduced until there remains only the regimental headquarters and two companies of infantry—a force inadequate for efficient duty of moment and an insufficiency—which in that particular led me to recommend in my late annual report that it be permanently withdrawn or increased.

With the construction of the railroad connecting the railway lines which pass through the northern and southern portions of the Territory and continue on to the Pacific coast, the strategic importance of the location was recognized by the then department commander, whose opinion was concurred in by the Commanding General of the Army and the Secretary of War. Directed estimates were submitted which were considered sufficient in amount to provide permanent barracks and headquarters for a battalion of four companies. They were based upon a careful personal inspection of the post by an officer of the Quartermaster's Department, and called for some \$20,000, but for some reason failed to receive action.

Later, and in 1896, attention was again invited to the importance of the post by the department commander, but beyond an expression of opinion, no action was taken toward repairing it or strengthening its garrison.

My recent inspection convinced me that the garrison should be increased by at least two companies, and that ample accommodations for such increase should be secured by the expenditure of \$30,000. During the last five years \$13,000 has been expended upon the occupied buildings and the water and sewer systems. This has kept such buildings in fair condition, and in some instances improved them. The two storehouses within the post proper have been repaired in roofs and walls. The pumping station and shops, which are usually well supplied with machinery and tools, and the grain and storehouses at the corral are excellent, and the stables are fairly good. Two barrack buildings and two or three sets of officers' quarters

are worthless; these, together with a row of married men's dilapidated quarters, removed, and new barracks constructed east of the parade, and considerably retired from the present line of same, would band up the commandery of the post and give it a pleasing appearance.

The water supply is abundant. Water is fully distributed throughout the post and corral from a reservoir sufficiently elevated to give much more than ordinary pressure. From the fact that it is taken from a well at the foot of the post, near Granite Creek, a stream which flows through Prescott before entering the military reservation, it has been supposed to be impure; but I do not think that satisfactory evidence of dangerous impurity has been discovered. The water seemed to me to be of good quality, and the post surgeon reports that it is ordinarily good. The system of distribution is faulty in some respects, but that and the poorly constructed sewers can easily be placed in excellent condition, the topography of the place favoring it.

The post can not be considered unhealthful. Although its sick rate has been high, it is accounted for by the frequent transfers to it, for treatment by its beneficial climate, of men afflicted with pulmonary diseases. An officer and five enlisted men have been so transferred during the past year. Excluding these, it is found that the percentage of actual sickness in line of duty at Whipple Barracks during the year ending with the 1st of the present month was 2.08. During October the post was the healthiest one in the department, and for the fiscal year of 1896 and 1897 its percentage was very slightly above the average of all department posts.

Regarding the criticism that the reservation, owing to its peculiar topographic features, is inadequate—that is a matter for argument, as well as the question of wholesome water. If adverse opinion is entertained on both subjects, it is unnecessary to urge it, as the remedies are at hand. The people of that section are intensely interested in the retention of the post. While there prominent citizens assured me that the strip of land adjoining the reservation, which I examined and which I found especially suited for target ranges or available for grazing purposes, would be donated to the Government on request, and that the city of Prescott would extend to the post its water main, which takes water from its mountain reservoirs.

It seems to me, therefore, considering all the existing circumstances, that unless it is determined to take away from the business and rapidly developing portion of Arizona (as yet struggling with the settlement of a considerable white floating population), and also from southern California, the assurance of military protection in seasons of danger, which the presence of troops exercises, Whipple Barracks should, as soon as practicable, be placed in proper condition to quarter a four-company battalion of infantry. The present garrison could be readily augmented to that extent by judiciously drawing from New Mexico and other Arizona posts.

Very respectfully, your obedient servant,

E. T. OTIS,

Brigadier General Commanding.

The ADJUTANT-GENERAL, UNITED STATES ARMY,
Washington, D. C.

The post has lately been used as a rendezvous for volunteers. As many as 800 troops have been located there for a considerable time, and I am informed by the surgeons that there has been practically no sickness among them, which should be convincing testimony as to the sanitary conditions of the place.

I earnestly recommend that the post be reëstablished and properly improved.

ARIZONA'S CONTRIBUTION TO THE WAR WITH SPAIN.

This Territory was first to respond to the nation's call, and her volunteers were the first mustered into service. Her sons freely shed their blood on Cuban soil to maintain their country's honor, and inscribed upon the nation's scroll of fame an imperishable record for patriotism and heroic bravery. Arizona's Rough Riders will always live in history. Such men as they always have and always will insure the supremacy of the United States among the nations of the earth.

The Territory's quota under the first call for volunteers was quickly filled, and under the second call the response was equally prompt, and many hundreds more than were called desired to go. It is hardly

proper to discriminate between localities, or to make comparisons, for all are heroes who entered their country's service, whether from Maine or Arizona; but if any portion of the Union has earned or deserves conspicuous mention, it is Arizona. The patriotism of our people is unquenchable, and their loyalty can never be shaken. Their enthusiasm and love of country entitle them to self-government.

STATEHOOD.

Arizona desires, above all things, to become a State. Constitutional rights should not be denied for sectional reasons, nor for alleged differences of opinion upon public questions. It is true that other reasons are at times given in a general way, based upon assertions and in no degree substantiated by proofs, but the facts are conspicuous that disputed financial theories, an unwarranted and offensive assumption of superiority because of location, and a selfish unwillingness to fairly distribute legislative power, too often furnish the motives which actuate the enemies of statehood in their unpatriotic and un-American refusal to accord to loyal citizens of this common country the rights and privileges vouchsafed by the Constitution. Such a despotic exercise of legislative power was never contemplated by that inspired work of our fathers which declared the equality of men. The question of opinion expressed upon the national monetary policy, or upon any specific policy or legislation, by different localities, has not in justice the remotest relation to the principles involved. The labored comparisons showing the ratio of population of the new Western States to the other States of the Union have no bearing whatever upon the rights vested under the Constitution, unless our system of government is to be changed and our laws, precedents, rights, and customs disregarded. An investigation of the record shows that but four of all the States admitted into the Union since 1791 had more than 100,000 people at the last census previous to admission, and three of the four—Kansas, Utah, and California—are west of the Mississippi River; and Maine, the other one of the four, was separated from Massachusetts.

Frequently articles appear in generally reputable newspapers of the Eastern States containing untruthful and misleading statements about the Territories, their people, civilization, and resources; and often ridicule is resorted to. Such methods are not only wholly inexcusable, but they display either ignorance or viciousness in a marked degree. The truth is that the remaining Territories possess greater resources, higher civilization, more perfect educational systems, and have a smaller percentage of illiteracy and crime than had a majority of the States when they were admitted.

The principles involved are well set out in the following report of a committee of Congress upon the admission of Florida:

The whole policy of this Government, and all the principles upon which its institutions rest, are adverse to the long continuance of a Territorial government over any portion of the citizens of the country. The right and the duty of self-government are fundamental maxims of the political system of America. The Territorial organization, for the purposes of local police over such portions of the public domain as are occupied by a population too weak to maintain the forms and exercise the prerogatives of an independent and sovereign organization, is never designed for other than a temporary purpose. It is contrary to a true policy, as well as to republican propriety, that a supreme and despotic rule should be held by this Government over any portion of the freemen of the land; and if, from the necessity of the case, the Government has been obliged to prescribe regulations for, and exercise control over, the inhabitants of Territories not included in the limits of any one of the sovereign States it has been with the design of raising them, by its fostering care and protec-

tion, with as little delay as possible, to a condition in which they may be able to assert and assume that high privilege of self-government which is the right of all men, and take their place as an independent community in the Union of American States. It is abhorrent to all the feelings and cherished principles of the freemen of this Republic that there should exist within its limits for any length of time, or for any time not demanded by an unavoidable necessity, a community of free citizens who, without participating in the conduct and the control of this Government, should be completely subject to its will and dictation. Nor is it compatible with the feelings which should actuate every American to submit for one moment longer than necessity obliges to a government imposed by the will of others, and in the form or conduct of which the governed have no other direction or voice than is allowed by the permission or favor of the governors.

The financial question is apparently no longer a forceful issue. Arizona is fitted for statehood, and should be admitted without longer delay.

CONDENSED RECOMMENDATIONS FOR CONGRESSIONAL LEGISLATION
AND ACTION OF THE INTERIOR DEPARTMENT.

- (1) That Arizona be admitted as a State.
- (2) That all the public lands within the Territory be ceded to the Territory or State.
- (3) That the military post of Whipple Barracks be reëstablished.
- (4) That a reasonable sum be appropriated for artesian-well boring in the Territory.
- (5) That a commission be appointed for ethnological and archæological research in the Territory, and that a suitable appropriation by Congress be had therefor.
- (6) That the salaries of the Federal judges within the Territory be increased.
- (7) That appropriation be had by Congress to pay the governors and secretaries of Territories the salaries allowed them by law. (Sec. 1845, Rev. Stat., 1878.)
- (8) That the pay of members of the Territorial legislature be increased.

Respectfully submitted.

N. O. MURPHY, *Governor.*

Hon. CORNELIUS N. BLISS,
Secretary of the Interior.

APPENDIX.

TERRITORIAL AFFAIRS AS REPORTED BY THE COMMISSIONERS OF IMMIGRATION FOR THE VARIOUS COUNTIES.

APACHE COUNTY.

Apache County is located in the northeastern corner of the Territory. It contains an area of 12,850 square miles, almost one-half of which is now reserved for the Navajo and Apache Indians, but will be eventually opened up for settlement. The county is peculiarly adapted for stock raising, which is at present the leading industry.

IDEAL STOCK RANGE.

The northern part of the county is occupied by the Navajo Indians, who own large herds of horses and sheep, which are kept on the open range the entire season without loss, having no other food or shelter than that naturally furnished by the range.

The central part of the county is an ideal range for all classes of live stock. It is a series of rolling hills and valleys, well watered by the Little Colorado River and its tributaries and numerous lakes and springs, producing an abundant variety of grasses and herbs, on which the stock thrive and fatten. The entire vicinity is partly covered with juniper, cedar, and piñon trees, which furnish excellent shelter during the stormy weather and a permanent supply of fuel for all purposes.

THE WHITE MOUNTAINS.

In the southern part of the county are located the White Mountains, which, being a series of open parks, well-watered with lakes, springs, and rivulets, can not be excelled for a summer range. The snows generally melt early in the spring, so that by the 1st of May the stock owners are able to enter with their sheep and commence lambing. Many herds are driven in from the counties south and west for the summer, and all find abundant pasture, the growth and variety of grasses surpassing any other locality in the Territory.

GREAT WATERSHED.

It is doubtful if it is generally known that these mountains comprise the greatest watershed or supply of pure mountain water to be found within the limits of the Territory. In verification of this statement, take a map of Arizona, and you will find that a circle 12 miles in diameter, with its center at the southwest corner of township 7 N., R. 30 E., will cut the head of the Little Colorado River, Blue River, White River, Salt or Black River, and the San Francisco River, the head waters of all these streams passing through as picturesque and grand scenery as can be found on this continent.

FISH AND GAME.

The magnificent streams of water named abound with that peerless game fish, the mountain trout, and in the forests the Nimrod can find the black-tailed deer, black and silver-tip bear, mountain lions, wild turkeys, and blue-winged grouse.

It is only a matter of time when these mountains will be a great summer resort. Anyone in quest of health, recreation, or a beautiful mountain home will need go no farther.

TIMBER.

The White Mountains form a large part of the great timber belt of northern Arizona, which is one of the Territory's most valuable resources. The area of timber

lands within Apache County is about 800 square miles. Numerous small sawmills furnish the lumber used in the local markets.

WATER-STORAGE RESERVOIRS.

A system of storage reservoirs, many of which have been completed, furnish plenty of water for the successful raising of crops in the valleys. Several large reservoirs are now being constructed, and the acreage under cultivation is rapidly increasing and many new homes are being built. Abundant crops of small grain, such as wheat, and oats, and barley, are produced, the quality of which is unexcelled anywhere.

FLOUR MILLS.

There are two flour mills located in the county, both being equipped with the latest improved machinery. The flour manufactured successfully competes with any imported from other localities, and the demand for the product is such that the mills are run to their full capacity during the entire season.

CATTLE.

Heretofore during the years past the principal industry in the county was cattle raising; but owing to the large profits to be gained the business was overdone and the range overcrowded.

The continued drought during the years 1890 to 1893 compelled many owners to sell and relieve the range. Many have since shipped out, until there are comparatively few cattle left on the range. The past few years have been very favorable, and those that have kept their herds are reaping a good harvest. The percentage of calves branded and the steers shipped has greatly increased, and the business is at present running on a paying basis.

SHEEP.

The principal industry in the county at present is sheep raising. The beneficial effect of the present tariff law, together with favorable range seasons, has caused the value of wool and mutton sheep to increase greatly, and ranges formerly occupied by cattle have been restocked with sheep. The spring clip of wool reached a total of nearly half a million pounds.

The present season has yielded an average increase in lambs of 90 per cent of the number of ewes. These are either sold to northern feeders or started on the trail to Phoenix about October 1. With favorable seasons the lambs driven south and fattened on the open range bring about the same price on the market as those which have been shipped north and fed corn.

This one great advantage that Arizona has will cause sheep raising to always be one of her leading industries.

TOWNS AND VILLAGES.

St. Johns, the county seat, is located on the Little Colorado River, in a beautiful valley which produces bountiful crops of lucern, sorghum, corn, and barley, and all varieties of fruit. The streets are lined with groves of shade trees, and many residences almost hidden in the beautiful growth of shrubbery and fruit trees. The population is about 1,500. The town contains two public schools, in which are employed five teachers. There are two churches, the Mormon and the Catholic. The county court-house and jail grounds have recently been beautified by the building of stone terraces and walks and the planting of shade trees. One weekly newspaper is published, the St. Johns Herald. It was established in 1887, is Democratic in politics, and is well patronized.

Springerville, located on the Little Colorado River, at the foot of the White Mountains, is the banner district for raising small grains. Here are produced fabulous crops of wheat and oats of a quality which can not be excelled. Two large store buildings are now being built to accommodate the increasing trade. The town contains many beautiful residences. The public buildings are substantial, and the town is rapidly increasing in population and wealth.

Concho is located in the central western part of the county, in a warm valley well protected by surrounding hills and ridges. Here are found the homes of many of the leading sheepowners, and in close vicinity of the town are large corrals used in shearing, dipping, and otherwise working the numerous herds of sheep. A wool-scouring plant is also successfully operated. The Concho wools have a well-known reputation, and are noted for their good quality. Orchards and vineyards also flourish here, and produce never-failing crops. The size and flavor of the fruit is excellent. Sorghum is the principal farm product and a good quality of molasses is manufactured, for which the vicinity is also noted.

her smaller towns, Alpine, Nutrioso, Eagerville, Amity, Lee Valley, Vernon, Concho, El Tull, and Walnut Grove, are all growing steadily and increasing the acreage of farming land.

PUBLIC SCHOOLS.

There are twelve district schools in the county, with six grammar and fourteen classes, twenty teachers being employed at an average salary of \$57 per month. The number of pupils enrolled is 879, the average length of term of schools, six months. The districts all have good, substantial, well-furnished schoolhouses. In the Concho district an elegant two-story brick school building is just being completed, which will accommodate four classes. This building has been built entirely at the subscription of the Mormon citizens, and will be opened this year as a district school.

Concho and Navajo districts private schools have been maintained by subscription of the citizens. Apache County is carefully fostering her schools, and they are all in excellent condition.

POPULATION.

The population of Apache County is about 5,500, and steadily increasing.

TAXABLE WEALTH.

Unimproved land (880,688 acres).....	\$443,862.00
Improvements.....	35,132.75
Undeveloped city lots.....	15,464.00
Improvements.....	42,184.00
Stock (2,414 head).....	44,925.00
Wheat (9,000 bushels).....	1,155.00
Barley (107 bushels).....	650.00
Wool (3,336 pounds).....	96,451.00
Hay (7,720 tons).....	116,580.00
Grain (36,000 bushels).....	625.58
Stock (42 head).....	397.50
Railroad (54,000 feet).....	272,410.00
Other property.....	96,233.75
Total.....	1,170,070.58

Apache County is in a flourishing condition; our people are industrious, and are steadily increasing. They realize the value of the natural resources so abundantly spread about them, and are utilizing them. The wealth and population are steadily increasing, and a bright and prosperous future awaits her.

COCHISE COUNTY.

Cochise County is located in the southeastern part of the Territory. Romance, history and record have combined to make this section of the Territory famous for its precious wealth-producing mines, its large cattle herds, climatic advantages, and agricultural possibilities.

Cochise County is 83 by 84 miles in area, and contains 6,972 square miles, an area five and one-third times greater than the State of Rhode Island, three and one-fourth times greater than the State of Delaware, and one and one-half times greater than the State of Connecticut. It is situated in the Continental divide, between the Pacific Ocean and the Gulf of Mexico, the highest altitude along the Southern Pacific Railroad from San Francisco to New Orleans being at Dragoon Summit, the altitude being about 4,800 feet above sea level.

The indomitable prospector and the intrepid pioneer who dared venture into the stronghold of the Apaches in search of the precious metals is Cochise County, Arizona indebted for her present advanced condition.

MINING.

The steadily increasing yield of bullion of Cochise County mines has won for her a national reputation and demonstrated, beyond cavil or doubt, the richness of its resources and earned distinction of the banner-mining county of the Territory. There is there to be found such a variety or extensive distribution of the precious metals. The mountain ranges, isolated peaks, buttes, and hills are found to be rich in minerals, a very network of veins and ledges. Besides the richness of its

ores, many natural advantages are offered for the prosecution of mining enterprises. Its climate stands unrivaled. Work can be prosecuted the year round without interference from the severity of the elements.

No mountains of snow and intense cold retard the operations for several months in the year, as is the case in less favored sections. The possibilities of this mineral section are without limit. Here is to be found virgin ground not yet prospected and barely touched by the pick or drill.

There are six mining districts in the county, and in each are found indications of veritable storehouses of treasure. Boundless latent wealth lies undeveloped and but awaits capital to direct the bullion to the trade marts of the world. A county so thoroughly mineralized will furnish discoveries for centuries to come. The mining industry of the county is truly in its infancy. When we look at the vast possibilities of the Huachuca, Whetstone, Mule, Dragoon, Chiricahua, and Swisshelm mountains we wonder that more has not been accomplished. Many mines have been discovered and many yet remain hidden in the rock-ribbed hills and mountains.

The Copper Glance camp on the western slope of the Huachuca is now and has for a long time been turning out its treasures for the use of man. Many prospectors have great faith in the wealth of the Huachuca, and the sound of the pick and drill is heard along its crags and canyons. Bonded mines, where the party who takes a bond agrees to develop the prospect, and, of course, if successful pays the stipulated price, are numerous throughout the Huachuca, and the parties are meeting with success.

What has been said of the Huachuca we have to repeat of the Dragons. The Middle-March Mining Company have a smelter ready to be fired up, a mine developed sufficiently to justify past expenditures. "This is a copper proposition," as the experts put it, yet its ores carry gold and silver. In this range also, near South Pass, is located the Golden States mining property. A good smelter is erected at the company's mines, which yield free smelting ores, rich in copper, with a fair percentage of gold and silver. This range of mountains also contains the renowned Commonwealth Mining Company's mines, to which reference is hereafter made. Many prospects in the Dragons have sufficiently developed to show, even to the novice in mining knowledge, that here is a rich field for the capitalist to increase his wealth. Many mines here are also under bond and developing valuable prospects of merit. This report is not intended to boom any prospector's property or supply free advertising for the speculator in mines, but merely to state facts as they appear, and can unhesitatingly say to the world that the Dragons are mountains rich in minerals. Gold, silver, copper, and lead abound along its entire length, vividly plain to the naked eye. Let the skeptical examine and be convinced.

In the Whetstone Mountains are developed copper deposits, which are also claiming the attention of mining men, and is a region of great promise.

Dos Cabezas is the gold-mining center of the county. Valuable gold deposits exist in the vicinity of the Two Heads Peak of the Chiricahua Mountains. The patient arrastre worker has made good wages grinding out the gold by mule power. Why may not the mill with its ponderous stamps bring tenfold results? The gold ore is at Dos Cabezas by the thousands of tons. We again repeat, what we have heard stated many times, there is no more inviting field for the goldbug than at Dos Cabezas.

In the Mule Mountains the Copper Queen Consolidated Mining Company at Bisbee holds forth to the world in operative skill the economic management of a great mining industry. How smoothly, without hitch or halt, the 1,200 men on its pay roll each performs his appointed part. No irritating friction in this army of men all working for a common purpose, each with a conscious thought of work well done.

In the Turquoise district, besides other minerals, is mined near Turquoise the precious stone from which the town and district takes its name. Many gems of value have been marketed from here.

Owing to the depreciation of silver, one important branch of mining in this county, as elsewhere, has been seriously hampered, although Tombstone stands preeminently at the head of the silver-producing districts, with a record of \$25,000,000 production of the white metal.

Among the metallurgical processes which have materially benefited Arizona must be classed the cyanide process for the extraction of gold and silver. Several plants have been introduced and are in successful operation in this county.

Herewith it will not be amiss to give a brief history of the discovery of the leading mines of this county, which may be interesting.

HISTORY OF DISCOVERIES.

The Tombstone mines were discovered in 1878, the sepulchral name being imparted to the city and original discovery by Ed Schieffelin, who first brought the district to light. When this persistent prospector announced his intention of exploring the country beyond Tucson, he was warned that he would find a tombstone instead of

a fortune, as to venture there was but to his grave. Nothing daunted by these gloomy prophecies, Schiefflin directed his steps east of the San Pedro, and in February, 1878, his energy was rewarded by making the bonanza discovery, and in remembrance of the doleful prophecy he named the place Tombstone, the city and district also having the same name conferred upon them. Schiefflin died May 17, 1897, and now rests in the spot selected by himself near Tombstone, where he first made camp, a big monument representing a mining location marking the resting place of Tombstone's discoverer.

Bisbee, the great copper camp, is located in the southern end of the Mule Mountains in this county, and the Copper Queen group of mines, one of the leading producers in the United States, here continues to pour forth its wealth in uninterrupted stream. This wonderful property was discovered by George Warren in 1878, and later others became interested. In 1880 Warren lost his interest in a foot race, and some of the owners gave it up, as they could see nothing "in sight." The mine has once changed hands for \$1,250,000, and to-day could not be bought for ten times that amount. The property has produced over \$1,000,000 in dividends. The production last year in round numbers was 24,000,000 pounds of copper. The product of the big blast furnaces is matte, which in turn is bessemerized or treated by converters of the Copper Queen or Williams type, and return the high average of 99.3 per cent of fine copper. The big plant is being continually enlarged, and its production increased each year. About 1,200 men are employed by the company.

The history of the discovery of the famous Commonwealth mine located at Pearce, named in honor of the locator of the discovery, is remarkable, for when, in 1895, John Pearce discovered the property, it had been passed over time and again by his predecessors. The prominent outcroppings had been known for years, the main road traversing within a few yards of the mountain of wealth, and many trails crossed the big ledge; but because of the peculiar formation and the character of the rocks it was disregarded by the experienced prospector until an assay test revealed its richness. A few months after the location the mine was purchased by the Commonwealth people for \$275,000. The richness of the ore has astonished the mining world, and its handsome yield makes the property one of the best producers in the West. A company mill and shipments of ore to the smelter together treat about 100 tons daily.

The surrounding districts about Bisbee and Pearce gives promise of developing other producers. Several companies have been formed to delve into the treasure-laden depths, and many prospects of merit are being developed.

PREHISTORIC EVIDENCES.

There is indisputable evidence of the ruins and traces of an unknown race in various parts of the Territory which were the habitation of the ancients in the dim and misty past. Fragments of coarse pottery are found scattered about mounds and caves, and crudely fashioned hammers, jars, and ollas have been unearthed. Outlines of artificial water courses have been traced along the San Pedro, showing that these people followed agricultural pursuits. Here, as in other parts of Arizona, is an interesting field for the savant who desires to trace the growth of civilization whose origin is shrouded in mystery. That mining was also carried on by these people is also in evidence, by ancient workings about Turquoise, where large excavations are found, and the crude methods employed in mining can yet be seen. Many interesting relics and curiosities abound here.

AGRICULTURE

Although Cochise County has been looked upon as a mining and grazing region only, there are large tracts of land exceedingly fertile, producing large crops. Thus, with proper cultivation and attention the dry, arid valleys, which were supposed to be incapable of production, grow magnificent crops, and wherever water can be had, its magic touch brings about a transformation and the desert dons its robe of green.

At St. David a colony has established itself and reclaimed a large body of land; irrigation by artesian wells is carried on, and the agricultural possibilities are manifest. Cochise County has the honor of having the only developed artesian water in the Territory, and at this thriving settlement there are now flourishing some 30 wells, affording abundance of water. The deepest well is less than 300 feet, and the flow appears undiminished. Along the San Pedro River, the Baibaomari, and mountain streams, a fair acreage is under cultivation and made most productive. The acreage cultivated in the county at present is estimated at about 5,000 acres.

RESERVOIR SITES.

There are two points in the San Pedro Valley where reservoirs could be built to advantage, and by the aid of which 3,000 and 2,000 acres, respectively, could be cul-

tivated. A storage reservoir, which would irrigate over 20,000 acres in Sulphur Spring Valley, is a project of magnitude which should appeal to capital. This is destined to become the garden spot of the Territory, with the application of water, now wasted, which could be easily stored.

STOCK RAISING.

The vast plains and mountain ranges of Cochise County afford unsurpassed facilities for cattle raising, and has special advantages as a grazing country. The climatic conditions are such that the percentage of loss is found to be smaller than in any other sections, and rates of natural increase greater. There are no losses from disease, and at no time need stock be sheltered or fed.

The valleys and ranges are covered with abundant feed for the sustenance of the numerous herds, and the pastoral pursuit is one of the most thriving and prosperous in the county. Considerable attention is now being paid by stockmen to the grading of cattle, which is found to be profitable.

The extent and importance of this industry can best be judged from the fact that Cochise County ranks second in the Territory in the number of cattle on our ranges, while horses, sheep, etc., occupy a prominent place on the Territorial assessment roll.

CLIMATE.

Whatever other advantages Cochise County may offer, it possesses a climate that is pronounced by medical opinion as healthful as any in the world. Here the health seeker will find nature offering her best gifts, pure and invigorating air, which, together with the abundance of water, the inspiring scenery, and the tonic effects of the sunshine, make all out of doors a natural sanitarium. Asthma, bronchitis, and even the dreaded disease, consumption, yield to the influences of our light mountain air while contagious diseases can not exist.

RAILROADS AND WEALTH.

Four railroads traverse a portion of the county, viz, the Southern Pacific, the Arizona and Southern, the New Mexico and Arizona, and the Globe and Northern railroads; the total mileage and valuation of which place Cochise County first and foremost in the Territory, while the assessed wealth is gradually increasing yearly.

SCENERY AND POINTS OF INTEREST.

The mountain ranges of the county afford grand scenic attractions and also are a hunter's paradise. Fort Huachuca, one of the principal posts in the Territory, is located in a picturesque spot in the Huachuca Mountains, and Cochise Stronghold, a natural fortress and the rendezvous of the once famous war chief of the Apaches, Cochise, after whom the county was named, is a point of interest situated in the Dragoon Mountains.

UNDEVELOPED RESOURCES.

Coal has been found in the Whetstone Mountains, but as yet this range has not been sufficiently prospected to determine its extent and quality.

Along the San Pedro are evidences of an oil-bearing strata, and with diligent explorations and proper machinery the striking of oil in paying quantities is not improbable.

Among other industries which could be established with profit are irrigation and storage reservoir enterprises; the cultivation of canaigre, which is indigenous to this soil and climate; a factory to extract the tannic acids; a tannery, custom ore reduction works, and well-equipped sanitarium.

MISCELLANEOUS.

There are 19 schools, with 27 teachers, in the county.

Twelve towns are located within its boundaries. At Tombstone, the county seat, is published the Daily Prospector, and the Tombstone Epitaph and Arizona Kicker, issued semiweekly; at Bisbee, the Orb, published daily and weekly, while at Wilcox is issued the Range News, weekly.

ABSTRACT OF ASSESSMENT ROLL.

The following is the abstract of the assessment roll for the past year:

Description of property.	Number.	Value.	Value of improvements.	Total value.
Lands acres..	116,921.87	\$115,519.00	\$73,990.00	\$189,509.00
Town and city lots.....	1,076.00	25,994.00	359,063.00	385,077.00
Horses.....	4,001.00	59,904.00		59,904.00
Mules.....	164.00	3,211.00		3,211.00
Asses.....	206.00	968.00		968.00
Cattle.....	64,063.00	643,505.00		643,505.00
Sheep.....	9,330.00	9,505.00		9,505.00
Goats.....	1,812.00	2,059.00		2,059.00
Swine.....	61.00	451.00		451.00
All other property.....				542,848.00
Railroads..... miles..	175.56	751,140.00	180,103.50	931,243.50

Total value of all property, \$2,764,800.50.

COCONINO COUNTY.

The taxable property in Coconino County, as recorded by the assessor for the year 1896, is as follows:

Land (698,884 acres).....	\$237,388.88
Improvements on land.....	17,167.41
Horses (3,068 head).....	629.11
Mules (21 head).....	960.00
Asses (39 head).....	175.50
Cattle (18,794 head).....	191,639.25
Sheep (183,750 head).....	259,087.50
Hogs (209 head).....	686.50
Goats (105 head).....	146.00
All other property.....	401,371.22
Town lots (4,537).....	136,626.67
Town lots, improvements.....	190,442.00
Railroad (118½ miles).....	539,330.00
Total.....	2,038,031.93

STOCK INDUSTRY.

Sheep breeding is rapidly resuming its former proportions and prospering under a new protective tariff. The range of the county is practically free, and there is grazing for ten times the number of sheep represented on the tax roll. Sheep are taking the place of cattle on the ranges.

The Government still has a large amount of land in the county open to the homesteader. This land embraces both timber, farming, and grazing lands. The farming lands are productive to a remarkable degree, and the remarkable results obtained from thrashing wheat, oats, and barley the past season has fully demonstrated the practicability of raising cereals successfully in this county, and our farmers are planting large acreage of same, which will necessitate the building of a flour mill.

Potatoes, beets, turnips, cabbage, and all hardy vegetables grow enormous and without irrigation. The snowfalls in winter and rainfalls in summer give the county moisture enough to raise crops without irrigation. There are many advantages in farming, and the county is worthy of the attention of the immigrant.

MINES.

The copper mines of the Grand Canyon are both extensive and rich, and a smelting plant has been erected at Williams to handle the ores from the mines. The asbestos mines have been developed, and ere long this product will be on the market of the world. Large deposits of coal, copper, red sandstone, and onyx—of the latter, in black onyx of good quality and in large deposits—have been found. Molybdenum has been found in quantities in the Grand Canyon.

LUMBER INDUSTRY.

With the only accessible pine forests within her borders, Coconino County has the supplying of lumber for the entire Territory. The manufacture of lumber is an

important industry, and furnishes employment for hundreds of men. There are at present 4 sawmills in the county, 1 each at Flagstaff, Grenlaw, Walker, and Williams. The output of these mills finds a market in Arizona, New Mexico, and southern California.

CLIMATE AND NATURAL ATTRACTIONS.

The delightful summer climate of the Colorado plateau attracts hundreds of visitors each year. This section abounds in natural attractions. The Grand Canyon of the Colorado River, the Cataract Canyon, the ruins of the prehistoric cliff and cave dwellers, Canyon Diablo, Oak Creek, Montezuma Wells, Natural Bridge, San Francisco Peak, and numerous extinct volcanoes and lava beds, and a hundred minor points of interest attract the visitors in increasing numbers each year.

CHURCHES.

The following denominations have churches in this county: Methodists, 2; Catholic, 2; Episcopal, 1; Presbyterian, 1; Mormon, 1. All have their church edifices and resident pastor.

SCHOOLS.

There are three district schools in the county, employing 12 teachers, at an average salary paid to male teachers of \$91 and to female teachers of \$70.71. The value of school property in the county is \$30,000. The number of children of school age in 1894 is about 700.

The county seat is Flagstaff, an incorporated town of 2,500 population. It has a fine court-house, public-school building, and churches, and will compare favorably with any Eastern town of its size. A water system costing \$85,000 is now being constructed and will be completed by the first of the year, and there will be an abundant supply of pure mountain spring water for domestic and manufacturing purposes.

Williams, 34 miles west of Flagstaff, is the second town of importance in the county. It has good schools, churches, and progressive citizens, and also lies within the pine belt.

ENTERPRISES THAT WOULD PAY.

A wool-scouring plant, flouring mill, furniture factory, steam laundry, a large hotel, a dairy, cheese factory, the raising of poultry, and truck farming are among the things that would pay.

GILA COUNTY.

Gila County lies in east central Arizona and is the most inaccessible portion of the Territory. It was formed from portions of Maricopa and Pinal counties in 1861. Since then a small strip has been added from Yavapai County on the north. It is surrounded on all sides by rugged and stately mountains, whose lofty peaks are covered with a fine forest of pine, while on the west the Superstitions, Four Peaks, and Matzals ranges are the natural boundaries. The dark rim of the Mogollons is the dividing line of the north, while on the east are the snowy White Mountains and Black ranges. Situated within these formidable barriers, it is an empire of itself, whose wonderful riches will yet make Arizona famous.

CLIMATE AND NATURAL OBJECTS OF INTEREST.

Arizona abounds in natural sights and curiosities of great interest, few of which are as yet much known or appreciated, owing to their remoteness from railroads and frequented highways.

Gila County is rich in these wonders of nature, the most noted of which is the Natural Bridge, on Pine Creek, in the northern portion of the county, which rivals the Natural Bridge of Virginia. It spans Pine Creek at a height of 200 feet, and the walls of the canyon rise above it on either side 700 feet. The bridge is of lime formation, and the inside of the arch, which is 250 feet across, is worn by the water as smooth as though chiseled by the trained hand of a stone mason. The arch on top is nearly 400 feet in width and 1,000 feet in length across the canyon, and the thinnest part only 6 feet through. Near the center of the arch is a hole large enough to admit the body of a man, through which one can look down into the crystal pool of water 200 feet below.

The dike which forms the bridge extends in a sweeping curve up the right side of the stream, and, together with the bridge proper, forms a surface area of about 50 acres of fertile land, which has been converted into a fine farm, irrigated from a spring which issues from the right side of the mountain.

The climate is exceedingly mild, and to this fact is ascribed the wonderful variety of vegetable growth, numbering some 250 trees, shrubs, vines, and plants, some of which are quite rare. The vicinity abounds in fossils and shells, and wherever moisture percolates through the calcareous rocks beautiful stalactites are formed. Underneath the bridge are numerous caves, which are lined with these pendent cones, resembling huge icicles.

On the ranch known as the Old John Gray place, between Payson and the rim of the Mogollon Mountains, is one of the finest springs, in all probability, in Arizona. It gushes forth from a perpendicular face of rock, a veritable river of clear cold water, and which, though possessing the inherent power to turn the wheel of industry, flows on unhindered, and few citizens of Gila County ever saw or are aware that 45 miles northeast of Globe, at the Shenley ranch, is a waterfall of surpassing beauty, and which in the height of the falls rivals some of the noted curiosities of the world. The stream shoots over the brow of the Butte and falls full 200 feet onto a bench, and before its tranquillity is regained it is precipitated 200 feet, throwing off a spray which is diffused by the wind and sparkles and glitters in the sunlight. True, it is not the mighty volume of the Niagara, but surpasses it in height of falls, and in grace and charm it rivals Minnehaha, which Longfellow's inspiration made famous.

Gila County also boasts of two hot springs, one of which is 30 miles north of San Carlos and the other on the Gila River, both of which are highly prized by the Apaches for their restorative qualities. Both of these springs are within the boundaries of the reservation and are not available to white men.

FRATERNAL SOCIETIES.

The Odd Fellows, Rebekas, Masons, Ancient Order of United Workmen, Knights of Pythias, Woodmen of the World, Independent Order of Good Templars, and Miners' Union all have flourishing lodges.

TAXABLE WEALTH.

All sources:	
1897	\$1, 216, 054. 80
1898	1, 167, 891. 00
Decrease	48, 163. 80

In a year of great prosperity this decrease may seem strange. It is explained by the fact that vast herds of cattle have been driven to market before assessment for 1898 or are being fattened for market in other counties and there assessed.

AGRICULTURE AND HORTICULTURE.

Wheat, barley, corn, and alfalfa are some of the leading agricultural products of the county, while in fruit growing and gardening we are able to show some as fine products as can be found in this or any other county. All of these products find a ready market in the home towns and mining camps. These industries are in their infancy, but in the near future are destined to become of vast importance.

CATTLE INDUSTRY.

The cattle industry is one of the greatest sources of profit, and probably no portion of Arizona is better adapted to cattle raising than Gila County. There were sold off the ranges this year nearly 20,000 head of cattle, bringing in a revenue of nearly \$300,000.

RAILROADS.

Gila County is the only portion of the Territory which has no railroads crossing its boundaries, and its progress has been further retarded by the White Mountain Indian Reservation. The extension of railroad construction throughout the West and Southwest has left few frontier towns of any importance. Where mining has built up a large place, railroads have been attracted to it. It is the inevitable history of the West and Southwest. The time must be near at hand when the freight wagons here will be a thing of the past and the railroads will come to take their place. Globe now enjoys a possibility of two railroads within a year. The Gila Valley, Globe and Northern is now as far as Geronimo, and it is said that the Indians will consent to a right of way across their reservation upon the payment of \$10,000. This road will not get the benefit of the nineteenth legislature granting the exemption of taxation for fifteen years, for the reason that the construction of the road through to Globe is but a continuation of it, for which ten years' exemption was given, three years of which have expired. The sentiment here is almost universally

in favor of the Phoenix road. Communication with the Salt River Valley is regarded as most desirable by the merchants. It will open a market for the produce of the Salt River Valley, which is now almost entirely excluded on account of the long distance it has to be freighted. There are practically no agricultural operations here. A few ranches owned by Chinamen supply the vegetables, but outside of this everything that is consumed in the camp comes from the outside.

MINING.

The principal and most important industry of Gila County is mining, and from the south end of the valley to the northern boundary mineral abounds. From the first discovery and opening of the mines they have been noted for their richness and variety.

The pride of the county is the Globe mining district. Here are vast copper mines which have been worked for years. The best, the Globe mine, has produced 70,000,000 pounds of ingot copper direct at the furnace 98.5 fine, valued at over \$7,000,000.

At the United Globe nearly 250 men are working at \$3 per day in the mines and at the company's smelter. This company is very popular in Globe. They have never had the slightest contention with their employees, and the manner in which the men are treated by them is a matter of comment on all sides. E. H. Cook, superintendent, and A. L. Waters, engineer and chemist, are very courteous gentlemen and deservedly popular at the camp. Phelps, Dodge & Co., of New York, who are the controlling owners of the United Globe, are now the owners of the Morenci properties, as well as the Copper Queen, at Bisbee, and valuable properties in the Big Bug district and Old Mexico. Here at Globe they have thirty-five contiguous claims, about half of which are being worked.

MANY RICH PROSPECTS.

The country for miles in all directions from Globe has been prospected thoroughly, and some very rich prospects are lying dormant. A very promising mineral country is in the Pinto Creek district, lying north of Webster Gulch. The proposed railroad from Phoenix will tap this district. It has been thoroughly prospected, and a very rich district will no doubt be opened there.

It is known to be rich in gold, copper, and lead. This district is 16 miles west from Globe. A great deal of prospecting has been done there in the last year. The ledges are large and run high in copper, gold, and silver. The Pinto Creek Mining Company is operating here. Mr. Blackmore of St. Joseph, Mo., is president; Grant S. Watkins, of the same place, secretary, and George O. Oldsfield, superintendent. This company has been working a small force of men all winter with encouraging results. They have extensive ledges carrying \$37.50 in gold and a good percentage of copper. Before fall the company expects to have machinery on its property.

The Kassar Gold Mining Company, of which John J. Gibbons, of New York, is president, and Miles W. Gibbons general manager, is a new company. Adjoining the Kassar property is the Diamond H group, which was recently purchased by this company. The Diamond H claims are just undergoing development work, and the Gibbons people expect to open up good mines here. Miles W. Gibbons is an expert miner, and he has great faith in their new property.

The Black Warrior is a Phoenix proposition, and of course has a local interest and is entitled to local pride. James A. Fleming and Dr. Ford are the controlling owners, and John White is the superintendent. W. H. Nickols, jr., of New York, and Jacob Langloth are also interested in this mine. The company owns a group of claims. The Black Warrior is in the Webster Gulch, west of Globe. The claims which have been developed are the Black Copper, opened to a depth of 130 feet, with various crosscuts and drifts in which they have encountered large bodies of copper ore; and Dadeville, which gives assurance of being a valuable claim. A working shaft will be sunk on this claim.

BLACK WARRIOR ENTERPRISE.

The ores are siliceous and do not carry a sufficient amount of iron to flux in smelting. In order to obtain fluxing material the company bonded recently a group of claims 10 miles north of Globe, known as the Eagle group. Work was begun on the new claim this week. A large ledge of iron carries about 50 per cent of iron and enough copper to pay for smelting and the expense of transportation. As depth is attained the ledge is expected to improve in copper. The company expects to construct a narrow-gauge railroad connecting the Eagle claims with their Webster Gulch property, a distance of about 17 miles. They will erect their smelting works midway between the groups in Pinal Valley, North of Globe, and on Pinal Creek.

THE BLACK WARRIOR.

John White, acting superintendent of the Black Warrior Copper Company, informs us that he increased his force and now has 45 men employed, and it is the intention to push the development work as rapidly as possible. A recent discovery of ore establishes the great value of the property. Development work last month comprised over 400 feet of drifting and sinking. The Montgomery tunnel has been driven 350 feet on the vein and is in low-grade ore the entire length. The company is making preparations to haul ore to the Buffalo smelter, and deliveries will begin about August 1 and will amount to probably 30 to 40 tons a day, the limit being 50 tons. There are now 500 tons of ore on the dump, and there will be no difficulty to supply the maximum quantity. About 1,800 feet of 18-inch gauge track has been laid from the Montgomery claim to the end of the wagon road to facilitate the handling of the ore.

The Continental mines are situated about 14 miles west of Globe. They were opened last fall by the North American Exploration Company of New York. The parties interested in the Continental also own an interest on the bond of the Black Warrior. They are working a force of about twenty-five men. N. L. Amster is superintendent and Edmunds de Strontz is the mining engineer and assistant superintendent. They have sunk something over 100 feet on the ledge and are now drifting a long tunnel to connect with the shaft. They have driven levels at 50 feet in depth and encountered fine bodies of ore. Their intention is to push the development as rapidly as possible, and as soon as results justify they will erect hoisting works. The Continental is believed to be one of the best copper properties in the district. The ore carries some gold and silver.

Six miles west of Globe the Lost Gulch Mining Company have a 10-stamp mill running for four or five months. The mill is still now, to allow better development of the mine. W. B. Girrard is president, and Murry Jones superintendent.

SILVER MINING.

In early days Globe was noted for its rich deposits of silver, and rich finds of native silver have made it celebrated, but owing to the steady decline in the price of bullion there was no output for the past year.

GOLD MINING.

The past year has been remarkable in the production of this metal, and from all sources the output for the past year has been:

Craig mill (162 ounces gold).....	\$2,754.00
Coleman mill (724.47 ounces gold)	12,621.99
Total	15,375.99

The northern portion of the county near Payson is rich in gold. Three small stamp mills are working part of the time, and the only thing that retards that section is its isolation.

The vicinity of Lost Gulch is rich in gold property. New companies are buying up property, and before long this section will produce a great deal of gold.

NEWSPAPERS.

Gila County has but one newspaper, *The Arizona Silver Belt*, published on Thursdays, and ably edited by the veteran Judge Hackney and J. H. Hamil.

This portion of our Territory has a glowing and bright future, and in common with the rest of Arizona is progressing upward. The industry and hospitality of its citizens are noted, and strangers traveling within her borders are struck with their kindness and liberality.

GRAHAM COUNTY.

Graham County was created in 1881 by an act of legislature. It was taken from the counties of Pima and Apache—all that portion north of the Gila River coming from the Apache and all south of the river coming from Pima. The county was bounded on the north by Gila and Apache counties, on the east by New Mexico, on the south by Cochise County, and on the west by Pima and Pinal counties. In area it contains about 10,000 square miles, or 6,400,000 acres—larger than several of the New England States. It is divided up into valleys and mountain ranges, and its altitude varies from 2,500 feet above sea level in the lowest valleys to a height of more than 10,000 feet on the summit of Mount Graham. The Graham Mountains are

in the southern portion of the county, and they are the highest mountains in southern Arizona.

The valleys along the streams are of the richest soil, and will produce well almost any variety of vegetation known to the Western Hemisphere. The farming industry of the country is confined almost exclusively to the valley lying on either side of the Gila River, which passes through it from southeast to northwest, though some small tracts of land are cultivated in the Aravaipa Canyon, and along the San Francisco River in the vicinity of Clifton.

The main Gila Valley in this county, which is the second largest in Arizona as measured by cultivated land, begins at what is known as Box Canyon, 9 miles above Solomonville, and extends down the river to San Carlos, a distance of 70 miles. It will average in width between the mesas about 4 miles, a greater portion being on the south side of the river, and contains not less than 100,000 acres of irrigable lands. As compared to other parts of Arizona, which is generally of a mountainous character, rich in mines, timber, and live stock, the Gila Valley is devoted to agriculture, horticulture, and livestock, exclusively. There is now under cultivation about 25,000 acres of land under the best system of irrigation, known in any irrigated country, as regards the extremely low price of water to the farmer. In the entire county there are about 125 miles of canals and ditches.

CLIMATE.

The altitude of this portion of the Gila Valley being about 3,000 feet, the climate here may be said to be a happy medium between the extremes of heat and cold. Frost is not infrequent in winter, but snow is a very rare thing, and generally disappears as fast as it falls. For short periods in winter the cold is biting, and ice 1 inch thick has been known to form, but this is a rare occurrence, and the average winter temperature requires no overcoat; sunshine is with us almost every day. In June, July, and August we have our hot weather, but extreme heat is never known for more than a week at a time. The temperature during these summer months may be stated at from 60° to 95°. The thermometer sometimes reaches 100°, and the extreme may be put at 105°, but this is a point seldom reached—not every year. A temperature of 90° in the Eastern States is far more prostrating and dangerous than the highest temperature experienced in this part of Arizona. Men work in the sun during the hottest days without injurious effects, and sunstroke is unknown. The absence of humidity in the atmosphere accounts for this favorable condition. The rainy season is expected to begin about the middle of July, and usually lasts for two months or more. We have no long continued rainfalls; it usually comes in showers, sometimes with considerable violence. Thunder and lightning are not common in the valleys, but are heavy in the mountains.

The following average temperatures in the Gila Valley are correct, according to official observation: Average spring temperature 60.5°; summer, 79.3°; autumn, 63.1°; highest 105.5°; lowest 15°; average annual 62.2°. In the valleys of Arizona beneficial effects are experienced by those suffering from lung and throat trouble. The worst cases, both from the East and the West, come here with the most beneficial results, many of them being permanently cured. The climatic desideratum in pulmonary diseases is a mild and dry climate. Southern California has a mild climate, but it is not dry. Colorado has a dry climate, but it is not mild. The valleys of Arizona are both mild and dry, and they have been universally recommended in pulmonary diseases. In the Gila Valley many are living to give testimony of miraculous benefits received. The dryness of the atmosphere is unfavorable to the transmission of disease germs, consequently malaria or epidemic diseases seldom prevail.

SOIL.

Orange Judd, editor of the *Prairie Farmer*, after a long visit to Arizona, says of the soil:

"Most of these valley soils are the accumulation of washings from the surrounding hills, made up of fine particles, that have been during countless centuries disintegrated by frost or the chemical action of the atmosphere. The water he (the farmer) uses is also charged with new fertility, thus produced annually and gathered from the sides of the mountains scores and hundreds of miles away, so that every flowing on the land benefits it. This is no theoretic idea. We have seen thousands of acres here growing crops that rival in luxuriance those found in the famed valleys of the Nile, which derives its vivifying liquid, bearing fertilizing elements, from the far off lands of upper Egypt and beyond.

The valleys of the Gila River derive their luxuriansness from the mountain regions of arid Arizona. The special committee of the United States Senate (Report 928, part 1, May 5, 1890, p. 60) says:

"Within our borders there can not be found a soil so uniformly fertile and so capable

of varied productions under irrigation as that of the Gila, Salt, and Santa Cruz rivers, in southern and central Arizona. Analysis of this soil shows its fertile qualities to be superior to the Nile earth."

The soil of the Gila River bottom lands is as nearly inexhaustible as any known to the world. The Maricopa Indians have raised wheat upon some of these lands continually since the advent of the early mission, in the seventeenth century.

IRRIGATION.

All the valleys of Arizona require irrigation, the rainfall not being sufficient to produce crops of any kind. For grain and alfalfa water is supplied by flooding the entire surface of the land between borders. For fruit it is run in furrows near the trees or vines. To clear, level, and prepare land for irrigation will cost from \$2 to \$10 per acre. As stated above, the system of irrigation in this valley is the most perfect known in the arid West. The canals are owned and controlled by the farmer actually cultivating the soil under them, each holding stock covering the amount of water required in an incorporated company. The average cost of water to the consumer is not over one-third what it costs in the Salt River Valley, or any other cultivated section of Arizona, being an average of not over 50 cents per acre per year, and about two-thirds of this is payable in labor on the canals as required to keep up necessary repairs. Water rights are worth about \$10 per acre. All the canals in Graham County are exempt from taxation. The water in the Gila River is very good for domestic purposes during the winter, but in the summer season wells are depended on for that purpose.

PRODUCTS.

The hardier fruits do well in the Gila Valley, but early peaches and apricots are liable to be killed by late frosts when they occur after the trees are in bloom. Apples, pears, grapes, and all kinds of berries yield a fine quality of fruit, much superior to that grown in the lower and warmer valleys. But fruit raising is not what Graham County farmers depend upon for revenue, but the staple crops, wheat, barley, corn, and alfalfa. Wheat will yield from 1,500 to 2,500 pounds to the acre; barley from 2,000 to 3,000 pounds; corn about the same as barley, according to cultivation. Barley is often cut for hay while the grain is in the milk, but alfalfa is the principal hay crop. Alfalfa will yield from 1 to 2 tons of hay per acre at each cutting, and is cut from three to five times a year, thus yielding from 5 to 10 tons per acre annually. Hay sells from \$5 to \$7 per ton; \$3.50 can be depended on in the stack. The cost of baling is \$3.50 per ton. Hay is worth always from \$10 to \$13 per ton in that portion of the valley tributary to Duncan, being consumed at the mining towns of Clifton, Morenci, and Carlisle. Alfalfa is unsurpassed as a forage, and is equally valuable for hay or pasturage. One acre of alfalfa pasture will support in prime condition two head of cattle or horses. Horses, cattle, sheep, and hogs are matured on alfalfa without being housed or fed one pound of grain. The mild climate and luxuriant pasture of this valley should attract attention as a favorable valley locality for breeding high-grade stock.

GRAZING.

Feeding cattle on alfalfa, thus furnishing a supply of fat beef for the mining camps and other markets tributary to this valley, is proving to be a most profitable business, and this industry, it is believed, promises the surest and best market for hay, as the surrounding cattle ranges furnish plenty of feeders, which can always be had at reasonable terms. Hog raising is a rapidly growing and lucrative industry. The only thing required for their thrift is to turn them into pasture; the alfalfa "does the rest."

GARDENING.

All kinds of vegetables grow to perfection and excellent markets are found near by. Vegetable gardening has been sorely neglected in this valley in the past, and the opportunity here is most inviting to the truck farmer. Lettuce, onions, and radishes can be grown practically the year round; potatoes, two crops; tomatoes and green corn for seven months in the year.

POULTRY.

There is an excellent profit in raising poultry. Chickens sell from \$3 to \$6 per dozen; turkeys, at \$1 to \$2 apiece; eggs, from 15 to 30 cents a dozen. Poultry is hauled many miles to the mining towns, where it is always in demand. The Fort Grant military post is also a splendid market for the products of the poultry yard.

TAXABLE WEALTH.

All sources:

1898	\$2, 265, 870. 65
1897	2, 023, 734. 70

Increase over last year 242, 135. 95

(For particulars see report of board of equalization.)

NATURAL ATTRACTIONS.

In the southern part of Graham County the most attractive feature of the landscape is the Graham mountain chain. Starting from the brown plain, the peaks rise, every gradation being plainly marked on their sides, from that of almost the tropic to that of the north temperate zone. On the lower level is the mesquite, the pale verde; then comes the iron wood, then the cedar and oak, then the lordly pine.

Within these pine forests near the summit in the summer is a very haven of delight, and many citizens spend several of the warm months with their families in these natural parks.

The pine is of a superior quality and is utilized by means of several sawmills. The roads to these mills make the summer resorts easily accessible to all who desire to visit them. Oak, alder, and walnut are also abundant, and will yet be utilized for manufacturing purposes. The mesquite, too, is a very valuable wood, being the best vegetable fuel known, and has great possibilities as a cabinet wood, owing to its close grain and capabilities of a fine polish. In the northern part of the county are also vast forests of excellent timber, as yet almost untouched by the axe. Transportation to them is as yet difficult, but they will remain a heritage of value to the county. Here is also a veritable huntsman's paradise, rendered additionally attractive by the fact that few white men have ever explored its wilderness. Game of some distinction—bear, mountain lion, and deer—is easy to find, while at the crystal brooks are to be found trout that never escape to the larger stream below. Beetling cliffs in their castellated grandeur, flanking lofty pine-covered mountains, are ever present to the view, till the panorama of nature's wondrous beauties seems never to end. Well indeed is it worthy the distinction of a national park.

THE UPPER GILA VALLEY.

Of this valley Prof. William Stowe Devol, of the United States experimental station at Tucson, says:

"I have had occasion to visit several times of late and examine the agricultural possibilities in the section of country in which you have the good fortune to reside, and I write to express to you, and, through your live periodical, to your many readers, my surprise at finding such an attractive valley in this corner of our wonderful Arizona and my pleasure on observing the rapid and substantial improvements being introduced in the development of this already important and most promising section.

"From above Solomonville to below Thomas the valley spreads out between the Gila range of mountains on the north and the imposing Graham Mountains on the south, a magnificent stretch of fertile soil, watered by an abundance of living waters. It is a matter of surprise to me to find such large crops grown in this valley. The usual yield is from 30 to 35 bushels of wheat per acre in ordinary seasons, and I have found one measured tract of but 1½ acres from which 96½ bushels of wheat were harvested, by actual weight. I find barley fields yielding from 60 to 65 bushels and corn 50 to 75 bushels per acre, with alfalfa in abundance for fattening cattle and a surplus for shipping to less favored sections; fruits of all kinds, and, best of all, perhaps, a favorable outlook for the sugar-beet industry. The upper Gila Valley is one of the garden spots of Arizona. All this has been brought about in a few years. It is but a few years since the valley was without a name, save that of 'Pueblo Viejo' (Old Town), as the ancient Mexican settlement was designated. Now the valley presents a succession, almost unbroken, of grain, alfalfa, and corn fields, with gardens and fruit orchards scattered here and there about the villages. And the villages—Pueblo Viejo has grown to, or rather has been superseded by, a long list of villages and towns—San Jose, Solomonville, Layton, Safford, Thatcher, Central, Pima, Mathewsville, Curtis, Thomas, Geronimo, with others yet to follow. Do you—can any one—wonder that I, in common with others who visit and inquire into the conditions and possibilities, am pleased with your valley?"

THE MINING INDUSTRY.

In Graham the principal development in mining has been in the Clifton district, where are located two great copper companies. The Lone Star district is now

attracting much attention because of its rich copper deposits, and owners of properties have recently begun development work with most encouraging results. A number of claims are being worked and two smelters are promised to be put in operation before the end of the year. The Lone Star district is located in the foothills of the Gila range, 12 miles north of Solomonville and about the same distance from Safford. The Clark mining district is located on the west side of the Graham Mountains and 40 miles northwest of Willcox, the nearest railroad station. Some very promising properties are to be seen here, from which good paying ore has been shipped, but only what was necessary to enable the owners to remain "on the ground" until they could secure financial aid in providing mills and smelters. The whole county is mineralized and deep development work will no doubt result in uncovering large bodies of ore to support a thriving camp.

In Arivaipa Canyon there are many mineral ledges, some of which are now being worked. The Grand Reef mine, now being developed by Messrs. Cunningham and Payne and others, is making a most satisfactory showing as depth is obtained. In what is known as Deer Creek coal fields, on the western border of the county, a strip of country recently ordered by Congressional act, to be segregated from the San Carlos Indian Reservation, are many ledges of high-grade copper, said to exceed anything ever before discovered in Arizona. Mining men who have examined this section declare that the future will bring here another large and prosperous mining camp for Graham County as soon as the Government announces its readiness to receive applications on claims in the regular way.

THE ARIZONA COPPER COMPANY.

The present plant of the Arizona Copper Company consists of four smelting furnaces, having a capacity of 400 tons per day; one sulphuric acid plant, capacity 8 tons per day; one siliceous ore concentrating plant with a capacity of 150 tons per day. The output of this company five years ago was equal to about 6,000,000 pounds of copper per year; in 1895 it had almost doubled, amounting to 11,000,000 pounds, and last year topped off its previous record by producing 13,000,000 pounds. At this time over half of the output is made of concentrating and leaching ores. The original owners could not treat anything less than 20 per cent ore. To-day ore as low as 3 per cent in copper is treated with profit. With the assistance of the Bessemer plant, now being put in position, a slightly larger output may be expected. The mines, however, are not being strained by immense daily outputs, the owners, like the owners of other Arizona copper mines, preferring that the mines should be treated as permanent and enduring enterprises, to the end that time may be given for development of the large undeveloped territories tributary to them.

The output of copper bullion in Graham County for the year 1897 exceeded 25,000,000 pounds. This amount, at a low estimate, will sell for \$2,000,000, which will go to our farmers, stockmen, mechanics, and miners for supplies and labor.

MORENCI, AND THE DETROIT COPPER COMPANY.

The town or mining camp of Morenci is one of the most picturesque in the Territory. It is located 7 miles from Clifton, in the hills, being some 1,500 feet higher. The town is built on a series of sloping hills. The population is largely Mexican, that class of labor predominating in the mines there. The town is built on the Catch-as-you-can plan, and houses of all shapes and sizes, built of adobe, mud, rocks, lumber, barrel staves, canvas, etc., can be seen clinging to the steep hillsides, one above another, covering a space of probably half a mile square.

Morenci is the home of the Detroit Mining Company, who have a magnificent reduction plant, consisting of a large concentrator, several huge smelting furnaces, and a Bessemer converter plant, the latter having been put in successful operation last year, and being the first operated in the Clifton district. The output of this plant was greatly increased by the addition of the converter process, and may now be estimated at nearly 750,000 pounds of copper monthly.

CLARK MINING DISTRICT.

In this district are located some mines that bid fair to become the best gold producers in Arizona, or of any State in the West. The district is new and comparatively unknown to the outside world, and like all new camps has many difficulties to overcome, consequently progress has been slow. The mines are generally owned by people of limited means, and very little deep mining has been done.

THE LONE STAR DISTRICT.

This district is located in the foothills of the Gila range, about 10 or 12 miles north of Solomonville and about the same distance from Safford. The district has attracted

considerable attention at times because of the discovery of very high-grade ore, but the amount of development work has been limited, owing to the lack of means on the part of the owners of claims and the heretofore isolated condition of the district and long wagon haul required to reach railroad transportation. The whole country in the district is streaked with small veins of high-grade copper ore, which appear on the surface. Since the building of the Gila Valley, Globe and Northern Railway, however, there has been renewed activity, and owners of several promising mines are at work, about 25 men being employed. A 10-ton custom smelter has been erected on the river 2 miles north of Safford, and a 30-ton smelter is promised for this fall. Every condition is favorable for cheaper mining and milling in the Lone Star district than in any other mineral district in Arizona, and herein is good reason why owners should exert every means to develop the value of their mines, which can only be done by sinking deeper on the ledges. The character of the country and ore already discovered is said to be similar to that of the Clifton district.

GRAHAM COUNTY STOCK INDUSTRY.

Graham County is well adapted to the stock-raising industry, which is one of the three leading industries depended upon by our people for prosperity. The facilities afforded by nature in this county for the growing of horses and cattle are equal to those of any other portion of the United States. The ranges afford a great variety of feed for stock, popularly classed under the head of grasses, both seed and root, browse and cacti. The hot weather of summer has proven to be especially beneficial for cattle, and during this time they thrive well. The mildness of the winter and warm weather of the other months are exceedingly well adapted to the growth and development of all kinds of stock. No snowstorms or blizzards visit this country to make the cattle industry one of anxiety and probable loss. There were 85,000 head of cattle returned for assessment in Graham County last year, which was several thousand more than any other Arizona county possessed.

TOWNS.

Clifton is one of the noted and important mining towns of Arizona, and is also the largest town in Graham County.

Duncan is a little town beautifully located on the Gila River and on the Arizona and New Mexico Railroad, about 40 miles east of Solomonville, and halfway between Clifton and Lordsburg. There is no better agricultural section in the Southwest than that portion of the Gila Valley extending from 4 miles above Duncan 20 miles down the river, and there is no section enjoying more general prosperity. The elevation is about 3,500 feet.

Bonita is the smallest town or settlement in the county having a post office; still it is a point of considerable commercial importance.

SAN CARLOS INDIAN RESERVATION.

The White Mountain Indian Reservation, commonly known as the San Carlos Indian Reservation, covers more than 75 square miles, lying in Gila, Apache, Navajo, and Graham counties, about one-fourth being in the latter.

Solomonville may be said to be the oldest town in the valley, and has attained greater prominence than any other town in the county.

Safford is a flourishing town 5 miles west of Solomonville, nestled in the valley and embowered in trees, with fine farms surrounding it on every hand. It was first laid out as a town site January 4, 1874.

Pima, located near the Gila River in the center of the valley, marks the first location of the Mormons in Graham County. A small colony arrived in 1879—7 men and 21 women and children. They came across the Mogollon Mountains by way of Fort Apache. They selected a spot between Ash Creek and Cottonwood Wash, where they pitched their tents in a mesquite forest, and named the place Smithville, which was afterwards changed to Pima.

Fort Thomas was for a number of years the lower town on the river in this valley. The town was originally known as Maxey, and came into existence with the establishment of Fort Thomas in 1876.

Geronimo is the youngest town in the county, being less than 2 years old. It is the present terminus of the Gila Valley, Globe and Northern Railway, and has a population of probably 300.

CLIFF DWELLINGS.

In Graham County are to be found many evidences of a prehistoric race, not the least of which are the cliff dwellings in Bonita Canyon on Bonita Creek, about 18 miles northeast of Solomonville.

PUBLIC SCHOOLS.

There are 28 schools in Graham County. Thirty-three teachers were employed last year. The census report shows that there are 2,408 within the school age of the county. The average term taught last year was six and a half months. The average salary paid teachers was \$57.68.

RAILROADS.

Graham County has two railroads. Three years ago the Gila Valley, Globe and Northern Railroad was built from Bowie station on the Southern Pacific, through the Gila Valley to Geronimo, on the line of the San Carlos Indian Reservation, where construction work was stopped because of inability to get right of way from the Apache Indians. The road enters the Gila Valley at Solomonville, the county seat, and passes through the cultivated district. The road is destined to go on to Lordsburg, where it is anxiously awaited, but it is not known when building will be resumed again.

The Arizona and New Mexico Railroad is owned and was built by the Arizona Copper Company, and connects the Clifton mining district with the Southern Pacific Railroad at Lordsburg. The railroad is 71 miles long, 41 miles being in Graham County. This road receives practically all of its business directly or indirectly from copper companies at Clifton or Morenci.

STATEHOOD.

The people of Graham County universally favor statehood for Arizona.

MARICOPA COUNTY.

In my last annual report Maricopa County has made steady progress in population, wealth, and in moral and social conditions. The county lies in the southern part of the Territory, and was created in 1871 from a part of Yavapai County. It embraces within its boundaries the great Salt River Valley, the fame of which is known to all parts of the world. This field contains one of the largest tracts of fertile land in the United States, estimated to be over 1,500,000 acres. The surface of this irrigable area is remarkably level, sloping by easy gradients to drainage canals, with which the entire county is abundantly supplied. From the northeast to the southwest, through the valley, flows the Salt River (a misnomer, as far as its properties are concerned), a distance of about 20 miles southwest of Phoenix, where it joins the Gila, which changes its course from west to southwest, crosses the eastern boundary line of the county, and enters the Colorado River at the town of Yuma.

The topographical features of the county are most pleasing. To the northeast and south are one continuous range of mountains and foothills, while through the valley are numerous curious formed peaks, all of which go to diversify and beautify what has most truthfully designated as one of the most lovely valleys on the American continent.

SOIL AND CLIMATE.

The soil of the Salt River Valley is incomparable in its productive capacities. In this respect it is limited only in this respect by its water supply. The mesa land is a gray, sandy loam, while nearer the streams it changes into a dark, rich soil, admirably adapted to the growth of alfalfa, wheat, barley, and all kinds of vegetables, sugar beets, watermelons, and muskmelons, while the lands of the mesas have demonstrated their fertility for the growth of oranges, lemons, and all citrus and deciduous fruits, they have no equal in this or any other country. The soil when irrigated is a rich alluvium, of a marvelous depth, and the waters which give life to the plants and trees in this garden of the New World, not unlike that of the Nile, carries a large percentage of sediment which is incomparable as a fertilizer and continually enriches the soil.

The Senate of the United States appointed a special committee to examine into the possibilities of irrigation, and they spent several days in intelligent examination of the soil, climate, and agricultural conditions of the Salt River Valley. In making their report we find on page 60 the following testimony: "A careful analysis of this soil shows its fertile qualities to be superior to the Nile earth." When we review the early history of civilization, its marvelous growth and development, we then realize that civilization and ancient greatness had its high tide along the course of that famous river, we marvel at the future of this new Eden of the West. Most of this valley's soils are the accumulated washings from the surround-

ing hills, made up of the fine particles that have been, during countless centuries, disintegrated by frost or the chemical action of the atmosphere. The water is also charged with new fertility. These produce annually and gather from the sides of the mountains, scores and hundreds of miles away, so that every flowing on the land benefits it. We have seen thousands of acres here growing crops that rival in luxuriansness those found in the famed valley of the Nile, which derives its vivifying liquids bearing fertilizing elements from the far-off land of Egypt. This valley of the Salt River derives its luxuriansness from the mountain regions of interior Arizona.

One fact here may show the value of irrigation as a fertilizer. The Pima and Maricopa Indians along the river in this valley live by farming and stock feeding. The system of irrigation used by them for centuries is of the rudest nature, yet they have always been self-supporting, never having cost the Government a dollar. They have no traditions running back to the time when their ancestors did not cultivate these same valleys, sowing from year to year the same variety of wheat, never changing the seed in all these years, and neither the grain or the soil show signs of deterioration. No wheat of greater beauty or more excellent quality can be found, and nothing beyond what irrigation had done in enriching their land from year to year has been done. They know nothing about fertilizers, and nothing at all about crop failures.

CLIMATE.

The climate of the Salt River Valley is semitropical. The heat is earlier in the season and more intense than in localities of similar altitudes near the seacoast. Yet this heat and long summer is one important factor in the productive character of the country.

Dr. H. E. Stroud, surgeon-general of the Territory, writing on the subject, says:

"It is a lamentable truth that a large per cent of the population of this world are not free to live where they choose, and where business and social interests demand, but are compelled to seek a climate in which they may enjoy health or, in many cases, where they can live at all, and especially is this true in the line of diseases of the respiratory organs.

"Periodically the world is startled with the discovery of some great antidote of the fearful scourge of humanity, consumption; but in every case at present these have been found worse than useless, and too often but unscrupulous money-making schemes. The highest authorities in the world agree that at present we have no remedy or antidote that will destroy the bacillus of consumption without destroying the patient, and in this dilemma attention is directed to the true and only remedy, which is dry air combined with mildness and the least possible change of temperature between day and night and from day to day.

"Arizona is a large Territory. Within its borders every possible altitude exists, from a few feet above sea level at Yuma, to eternal snow in the mountains. It is difficult to appreciate that one condition exists in all the regions, regardless of altitude, namely, dryness.

"This fact is proved not only by Government observations but by the testimony of the entire population. The dryness is perpetual; dead animals desiccate, so also does refuse matter. It is this dryness, with entire absence of dew and fog, that makes it desirable to sleep out of doors from May until October, and many sleep out the year round.

"The winter climate is delightful; it seldom frosts and never freezes. One bright, sunshiny day follows another. Rains often occur between December and February, but entirely insufficient for agriculture. The days are warm and pleasant, and the nights cool and exhilarating; the country green and pretty. Flowers bloom and oranges as fine as any in the world ripen. Such a winter climate is beneficial and pleasant, but it is the heat of summer that is especially curative. The heat is peculiar—it is never oppressive except after one of the infrequent rains; at other times the great dryness makes the heat tolerable, or even comfortable. So little illness of any kind occurs in summer that physicians alone are sick.

"It is strange, but perfectly true, that there has never been, to my knowledge, a case of infantile diarrhoea during the hot season. That terrible disease, cholera infantum, is positively unknown to us. Again, the longer one lives here the more he prefers the summers, and as a matter of health they are incomparable.

"We have no tornadoes, cyclones, or sunstrokes. A very important point is the food supply, not only for invalids, but for others, especially regarding the meats. The pale clerk who eats meat twice a day will outwear the burly workman whose size is grown on potatoes, corn, and other starches. I can truthfully say that I have never seen better meats in Europe or America than are daily sold in Phoenix. The gardeners supply green vegetables every day in the year, and fruits are plentiful and good.

"Speaking of Phoenix, it is located in a large valley; the altitude is 1,100 feet. If the question were asked, What disease is the climate of Arizona not adapted for? I

would answer, I don't know. The altitude is not high enough to cause nervousness or hemorrhagic tendencies, neither is it too high for most cases of heart disease."

SPECIAL ADVANTAGES.

The Salt River Valley has many advantages besides its climate, soil, and conditions. It is located 500 miles nearer the world's markets than its only rival, southern California. Added to this important fact, it is six weeks earlier in the markets with its apricots, grapes, oranges, and peaches, thus forever sure of securing a ready sale for its products. The early fruits always command the highest prices and most ready sale, hence it is unnecessary to dwell upon the unparalleled advantages held by this valley over any and all rivals in the field.

The extensive alfalfa fields in this valley offers golden opportunity for the fattening of stock, and the stockmen of the various counties have taken advantage of the opportunities offered, and this has added a new and profitable field to the farmer. The number of foreign cattle pastured on the Salt River Valley during the past two years has been phenomenal, and both farmer and the stockmen have received substantial benefits from such investment.

MINERAL SPRINGS.

In the mountain regions of the county are found many mineral springs of medicinal value. At present many of them are inaccessible for the want of good roads.

At Agua Caliente, in the southwestern part of the county, are some valuable hot springs, which have long been resorted to for their health-giving properties.

POPULATION.

In my last annual report I estimated the population of the county at 33,000. I find that it is a very difficult matter to treat this matter with the degree of accuracy which its importance demands. Conditions differ very widely here from those in long-settled communities. A very large portion consists of young men who are engaged in mining, prospecting, cattle raising, and herding in the mountain regions of the county, and whose names do not appear on the voting registers. Many with families are also scattered through the mining and cattle camps, names of whose children do not appear on the school registers, so that no estimate based upon these sources will apply here with any degree of accuracy. I believe that the population of the county at this time, if properly numbered, would be rather over than under my former estimate. The rate of increase I estimate to be from 5 to 10 per cent yearly.

These people have come from all parts of the Southern, Middle, New England, and older Western States, and from northern, middle, and southern Europe. They are cosmopolitan in make up, and represent a high average of the best thought, impulse, experience, enterprise, and skill of the civilized world. They entertain a higher measure of hospitality—genuine social and business hospitality—than is to be found in many older communities. With such a people the work of ages, in older lands, is compassed here in a decade. Seeking wider fields, they have met here in this great valley—brave, confident, self-reliant, self-helpful, quick, ready, and practical. With them there is no doubting, no halting, and no waiting. The result is seen on every hand—in the enterprise, liberality, intelligence, liberal views, and progressive ways of the community.

TAXABLE WEALTH.

The assessment roll for the county for the year ending June 31, 1897, was as follows:

Description of property.	Number.	Value.	Value of improvements.	Total value.
Land acres..	248,322	\$3,311,812.00	\$495,973.00	\$3,807,785.00
Town and city lots.....		2,468,052.00	1,195,206.00	3,663,258.00
Horses.....	4,458			105,337.00
Mules.....	212			5,312.00
Asses.....	31			165.00
Cattle.....	21,144			223,430.00
Sheep.....	8,539			17,078.00
Goats.....	1,052			1,555.00
Swine.....	5,505			10,451.00
All other property.....				795,478.63
Railroads miles..	97			458,690.37
Cows.....	3,069			75,670.00
Unpatented lands unassessed.....				
Total value				9,164,210.00
Assessment for 1897.....				8,948,043.00
Increase over 1897				216,167.00

Real value of all property in the county is not less than \$30,000,000.

AGRICULTURE.

Farming on an extensive scale, small farming, horticulture, market gardening, stock raising, and the grazing and fattening of stock from the mountain pastures and ranges are the pleasant and profitable pursuits of a large percentage of the rural population of the county. Practically the crop seasons extend through the entire year.

ACREAGE IN CULTIVATION.

At this time there are 280,000 acres in cultivation in the county, of which 10,000 acres are devoted to horticulture. (This includes school lands.) The following will show approximately the number of acres devoted to the products named:

Wheat	100,000	Figs	300
Alfalfa	105,000	Oranges	2,500
Miscellaneous crops	12,000	Lemons	100
Vines, raisins, and other grapes ..	4,500	Pomegranates	50
Apricots	1,500	Blackberries	10
Peaches	1,500	Quinces	25
Pears	1,000	Grain hay	20,000
Almonds	500	Sugar cane and sorghum	5,000
Strawberries	300	Timber culture	11,000
Plums	300	Ramie	2,500
Apples	100	Canaigre	2,000

FIELD CROPS.

Wheat, barley, corn, alfalfa, sugar cane, sorghum, ramie, sugar beets, etc., are the staple field crops of the county. Wheat and barley can be sown at any time between the months of October and March, and yield about 1,500 pounds to the acre. Corn does best planted in July. Alfalfa, or French lucern, is a perennial field grass of remarkable fattening properties. Under irrigation it can be cut from four to six times each year, and yields from 2 to 4 tons of hay per acre to each cutting. Both cattle and hogs fatten rapidly upon it. Cut for hay or rented to the cattle ranchmen, the annual return per acre will average not less than \$40. Sugar cane and sorghum are grown only for home consumption. The ramie and sugar beet are both new agricultural industries in this county. They have been thoroughly tested. Two thousand five hundred acres near Phoenix are now being prepared for the cultivation of canaigre, a tannic root of great commercial value. Sweet potatoes, pumpkins of all varieties, ground peas, or "goobers," peas, and beans are also grown as field crops and exported in large quantities beyond the county.

Experiments in cotton growing have been made, the results proving beyond a doubt that the soil and climate of the valley are well adapted to the cultivation of this great staple. Fully 2,000 pounds per acre are the result of these experiments. The long haul to market and high freight rates will for many years, however, deter our people from engaging in cotton planting to any extent.

Experiments with the tobacco plant have also been made in the United States experimental station near Phoenix. Eleven varieties were tested last year, and all show good results, the Spanish, Brazilian, and white burley being especially noted for fine growth and texture.

CANAIGRE.

The eighteenth legislature passed an act "To promote the raising of canaigre and the manufacture of tanning extract therefrom." Under the provisions of this act a plant was established at Phoenix and another at Tempe. Success immediately followed, and now this new agricultural industry promises to be one of great importance to the county, and in fact to all of southern Arizona.

The tuber is indigenous to this region and has long been used by the aboriginal and Mexican population in the production of leather. It contains a large per cent of tannin, and recent experiments show that it is of superior value in the production of high grades of patent leather, in the manufacture of which large amounts are paid out each year by the Government on imports of gamier and other tannin extracts. The cultivation of this tuber is beginning to be extensively engaged in in this county.

SUGAR BEET.

The sugar beet has been thoroughly tested in this valley on sixty-one different ranches during the past year. Additional tests have been made under the direction and supervision of Professor Devo, of the University of Arizona, the director of the

United States experimental station at Phoenix. All of these experiments have given exceptional results. All that is now lacking to make the cultivation of the sugar beet one of the leading industries of the county is the necessary capital to erect suitable mills for the manufacture of sugar on a large scale.

HORTICULTURE.

Year after year hundreds of acres are being added to this industry in Maricopa County. Experiments in this line are no longer necessary, as it has been fully demonstrated that there are found the soils, elevation, equable temperature, climatic softness, and other requisites for the perfection of all, or nearly all, of the fruits of the middle and semitropical latitudes. Her people no longer marvel at the transformation which is going on, though the Northern and Eastern visitors will continue to express genuine surprise when they first look upon the vast orchards, vineyards, and gardens of this valley.

In my opinion this industry is destined to become the greatest source of wealth of her people. Trees and vines mature earlier, yield more generous fruitage, have fewer enemies, have longer seasons for growth and perfection of fruit than elsewhere in the country, even California, over which favored section this valley has the additional advantage of being several hours nearer the great markets of the East.

In the foothills, valleys, and slopes the orange, the lemon, as well as other semitropical fruits, do best while anywhere in the valley the peach, pear, apricot, cherry, nectarine, almond, English walnut, olive, plum, pomegranate, fig, etc., and all the small fruits, do well. Especially noteworthy among the garden fruits is the strawberry, which yields bountifully and is of rare size and flavor. It is now a staple crop, and the acreage under cultivation is being rapidly increased.

GRAPE CULTURE.

Fully 4,500 acres are devoted to this industry in Maricopa County. More than one-half of the vines are of the raisin variety, the Malaga, Muscat, and Sultana leading, while the table varieties comprise the Black Hamburg, Lady Downing, Tokay, Rose of Peru, Mission, and others. The Zinfandel is a fine wine grape, and from it a splendid claret is being manufactured at Mesa City, where a great deal of attention is being paid to this and the production of finer and lighter grades and brands from other varieties of wine grapes.

MARKET GARDENING.

Near the cities and towns along the railroads this industry is making rapid progress. No more pleasant or profitable agricultural occupation exists. Markets for produce are practically illimitable, as the growth of cities and towns and facilities for reaching the mining camps keep constantly in advance of the production. To the home seekers, and people of energy and small means this industry offers many advantages. Under our system of irrigation the years record no failures. The Scriptural injunction, "Plant * * * and eat the fruit thereof," is here fully verified. A season is always at hand. It is but the work of a few moments to raise the "head gate," and a season is on. Shut it down, and it is off. Under such conditions perpetual verdure and perpetual growth is assured, ideal farming practicable. Every month in the year vegetables can be grown and marketed.

With equal facility there can be grown here melons, potatoes, cabbage, beans, pease, lettuce, turnips, beets, carrots, parsnips, radishes, peppers, celery, rhubarb, egg plant, spinach, and, in fact, every vegetable grown in temperate and semitropical regions.

SMALL-FRUIT FARMING.

This delightful and profitable industry has as yet attracted the attention of but few specialists in this county, yet no calling is surer of large returns on the investment of the needed capital, labor, and experience. Blackberries, raspberries, gooseberries, special lines of table grapes, strawberries, and many other small fruits, grow here in perfection. A home market exists for all these products which is never adequately supplied, though the profits from them can not be less than from \$300 to \$500 per acre yearly.

POULTRY.

Many colossal fortunes have been built up from less promising occupations than are offered by this line of industry in Maricopa County. Domestic fowls do well here, are subject to few diseases, and are remarkably prolific. One lady engaged in chicken ranching informed the writer hereof that last year and for many years past

she has realized a net profit on turkeys alone of \$500. Few occupations in the valley offer greater inducements or give better returns on the required capital. Plant an alfalfa patch, purchase a few tons of waste from threshers, erect a few sheds, and secure the necessary stock, and the rancher is ready for business with the certainty of a cash market right at the ranch door. The egg and chicken peddlers are many and are always abroad in the land.

BEE CULTURE.

Bee culture is a most pleasant and profitable occupation in this valley. Pasturage is unlimited. There are now in the county about 6,000 stands of bees and the average produce is about 100 pounds per stand. It is of the finest quality and flavor and finds ready market in Eastern cities.

LIVE STOCK.

The live-stock industry is in a better condition in this county than it has been for many years past. Our mountain and foothill ranges are all in first-class condition, resulting from the bountiful rainfall during the summer months. Our alfalfa fields are also in fine condition and are being profitably utilized by ranchmen and cattlemen in fattening large herds of cattle, sheep, and hogs for market. The number of head of cattle now being fed and fattened on the alfalfa fields of the county, on which taxes are being paid in other counties, is estimated at about 30,000. The number of horses, mules, and sheep and hogs is not known, but is very large.

PREHISTORIC RELICS AND RUINS.

Maricopa County is rich in prehistoric relics. Ruins of ancient cities, towns, and temples can be traced in many parts of the valley. Lieutenant Cushing, of the Hemmingway Archaeological Expedition, informed the writer hereof that he had traced the foundation of a city south of Tempe a distance of nearly 6 miles. He also expressed the opinion, from investigation, that what is now Maricopa County at one time contained a population many times greater than the entire population of the Territory. Many remains of irrigation works are to be found, and some of them have been utilized by modern engineers.

CITIES AND TOWNS.

Phoenix, centrally located, is the county seat and capital of the Territory. It contains a population of at least 15,000, and is probably better equipped with modern improvements than any city of its age and size in the country. It has 2 electric plants, 2 electric street railroads, 2 large steam flouring mills, 2 ice factories, 2 foundries, and 2 gas plants, 4 large modern school buildings, 1 high school, water-works, city hall, 9 churches, 3 large hotels, a number of lodging houses and restaurants, natatorium, 4 parks, 1 business college, Territorial insane asylum, 1 county hospital, 1 soap factory and packing house, and an excellent sewerage system. There are three daily newspapers and 4 weeklies. Two railroads enter the city—the Santa Fe, Prescott and Phoenix—connecting the city with the large Santa Fe system to the north, and the Maricopa and Phoenix, connecting the city with the great Southern Pacific to the south. These roads have shown great liberality and public spirit in the assistance and the building up of the great interests of this valley and Territory.

OTHER TOWNS.

Tempe, situated about 9 miles east of Phoenix, contains a population of about 1,500. It has 1 large flouring mill, driven by water power, 1 street railroad, ample hotel and boarding-house accommodations, and a fine public-school building, and is the seat of the territorial normal school. The Maricopa and Phoenix Railroad connects it with the Southern Pacific system. Tempe has 1 daily and 1 weekly newspaper.

Mesa City, situated about 18 miles southeast of Phoenix, contains a population of about 2,000. It has 1 large steam flouring mill, 1 large public-school building, 1 weekly newspaper, and is surrounded by a magnificent agricultural and horticultural region. It is connected with Tempe and Phoenix by a branch of the Maricopa and Phoenix Railroad. Near it are some magnificent water powers, soon to be developed for milling and other manufacturing purposes.

Lehi, situated 4 miles north of Mesa, is a prosperous agricultural village, and has a commodious public-school building.

Gila Bend, situated about 65 miles southwest of Phoenix, on the Southern Pacific Railroad, is a prosperous town of about 500 inhabitants. It has one weekly paper,

has prosperous trade, and is destined to become a place of considerable importance on the completion of the great lines of canals now under construction in that neighborhood.

Agua Caliente, Sidney, Alhambra, Peoria, Glendale, Phoenix Mine, and Fort McDowell are all prosperous villages, and offer abundant inducements to the home seeker.

The following are some of the enterprises to which the attention of capitalists and investors is called, and it is believed will prove highly remunerative: Reduction works for the treatment of ore, a sanitarium for the treatment of lung diseases, brewery, mattress factory, sugar-beet factory, etc.

HOTELS, SALOONS, ETC.

There are in the county, under license, 10 hotels, 23 restaurants, and 78 saloons.

FRATERNAL SOCIETIES.

There are in the county: Masonic lodges, 3; Odd Fellows, 3; Foresters, 1; Knights of Pythias, 1; Ancient Order of United Workmen, 2; Woodmen of the World, 2; Grand Army of the Republic, 1; Confederate Veterans, 1; Benevolent and Protective Order of Elks, 1; Independent Order of Red Men, 2.

PUBLIC SCHOOLS.

The following table will show the condition of the schools of the county during the past year:

Number of teachers.....	93
Number of school districts.....	47
Number of boys enrolled.....	2,068
Number of girls enrolled.....	1,869
Total enrollment of pupils.....	3,937
Number of children of school age last census.....	4,310
Average length of term (months).....	7
Average salary of teachers.....	\$64.00
Number of teachers examined.....	25
Number receiving certificates.....	20
Rate of school tax.....	\$0.60
Amount of salaries paid teachers.....	\$46,317.31
Amount expended, all sources.....	\$62,213.16
Total valuation of school property.....	\$202,445.00

Add to the number of children enrolled (for isolated camps, absent and overlooked by census marshal) at least seventy-five, which will place the enrollment at about what it should be.

INDIAN SCHOOL AND RESERVATION.—There are three Indian reservations in the county—the Papago, at Gila Bend; the Pima, in the southeast part of the county, and the Maricopa, near Phoenix. Local schools are sustained at all of these reservations. At Phoenix the Government has erected large and commodious school buildings for the exclusive use of the Indians. The interest manifested in them by the Government and all religious denominations, and the eagerness shown by them in adopting civilized methods and habits, are most gratifying. These Indians have ever been friendly to the whites, and there are many traditions extant of timely aid and assistance extended by them in early days of migration to the Pacific coast.

The policy now being pursued by the Government of educating these Indians and then returning them to their reservations, there to almost immediately drift back into the old ways and methods, is, in my opinion, wrong. A better plan, it seems to me, would be to allot to each of these male Indians a small tract of land, with water for irrigation, and for the first year at least to assist them with sufficient means to make a beginning. In this way tribal relations would be soon broken up and the educated Indian placed in a position to become a useful citizen.

CHURCHES.

The following denominations have active organizations in this county, and some of these have church edifices that would attract attention and favorable comment in much elder communities:

Methodist Episcopal, 6; Methodist Episcopal South, 8; Baptist, 4; Episcopal, 2; Presbyterian, 2; Congregational, 1; Dunkard, 1; Catholic, 3; Mormon, 3; Salvation Army, 1.

MINING AND PROSPECTING.

Though Maricopa County is practically agricultural, its mining industry is of great importance, for there are thousands of dollars of the precious metals taken out of the mineral vaults of the mountains that surround our farming districts. The search for gold was what first brought men to the valley as settlers. In the Superstition Mountains new discoveries continue to be made, where (at Camp Goldfield) several mills are operated on gold properties. At Cave Creek, Castle Creek, Wickenburg, and in the Haqua Hala Mountains great activity in prospecting and development work continues. Many placer discoveries have been made in the foothills and valleys, and as water for working them is developed the output will be considerably increased.

The output for the past year I estimate at \$200,000.

EXPORTS.

The following are some of the products of the county which are exported every year in large quantities: Wheat, flour, barley, fat cattle, hogs, sheep, dried and green fruit, bran and hides, wool, ore, honey, onyx, building stone, raisins, alfalfa hay, alfalfa seed, gold, silver, and copper.

COMMERCIAL TIMBER AND FUEL.

The county is deficient in commercial timber, though the mesquite and ironwood could be profitably utilized in the manufacture of furniture as a veneering. They are hard and durable and susceptible of a high polish. The colors are variegated and beautiful. At present they are used only for fuel, fence posts, etc. Lombardy and Carolina poplar, mountain ash, and China umbrella trees grow quickly and make beautiful avenues and shady parks. The cottonwood and poplar outgrow all others, and when cut green and planted as posts on border ditches soon take root and become living posts for wire fences.

RESERVOIR SITES.

In the mountain gorges and along the streams mentioned are to be found many magnificent reservoir sites, some of which are being utilized by private and associated capitalists.

The construction of storage dams of sufficient capacity to reclaim all lands, arable and irrigable, of the county would require a large amount of capital. Such enterprises should receive Government aid. A speedy return in money from the sale of these lands under existing Congressional enactments, in the almost immediate increase in the taxable wealth of the country, and the satisfaction to be derived from making it possible to create homesteads of inexhaustible fertility for thousands upon thousands of worthy citizens where now the coyote and jack rabbit roam at will, surely ought to be sufficient inducement for lending the comparatively light aid and assistance here alluded to.

In furtherance of this important matter, when making up your report to the Interior Department, I most earnestly invite your excellency's attention.

IRRIGATION.

In all farming and kindred occupations in the Salt River Valley irrigation is wholly depended upon; hence the water question is one of vital importance to our people. It can not be denied that the natural flow of our rivers and creeks is already taxed to their fullest limit, and that storage of water exists and will continue to exist during the summer months. Something must be done to utilize the many splendid reservoir sites which nature has provided. We have many promises of speedy relief, but as yet little has been accomplished. True, great progress is being made in reducing our present wasteful system to something like scientific treatment.

Two new canals of large capacity (which I added to the list contained in my last annual report) will soon be ready to turn in the precious fluid. Great activity in clearing and otherwise preparing for cultivation the lands under them is in progress.

These two great enterprises (Rio Verde and Agua Fria canals) will cover about 350,000 acres of what is known as desert land, a large part of which is now open for entry, under the desert and homestead acts of Congress.

Under these two canals lies, largely, the great orange and lemon and semitropical fruit belt. Lovely Paradise Valley, a large body of mesa land, protected on the north by a high range of mountain, and on the east and southeast by a low range of hills, is traversed its whole length by the Rio Verde Canal. Here, under the magic effects of water, the visitor will soon find a paradise in fact as well as in name.

The Agua Fria Canal begins its course to the west and southwest of where the Rio Verde ends, and along its course lies a vast stretch of country, of a very high grade of fertility and productiveness. The following is a list of the canals in the county, eighteen of which are complete and in full operation:

Name of canal.	Flow (miner's inches).	Length (in miles).	
		Main canal.	Laterals.
Highland.....	6,000	18	80
Mesa (consolidated).....	40,000	7	100
Utah.....	6,000	8	16
Tempe.....	20,000	8	51
San Francisco.....	5,000	7	12
Arizona.....	40,000	60	156
Grand.....	12,000	25	80
Salt River Valley.....	6,000	15	20
Maricopa.....	6,000	8	20
Farmers.....	1,500	7	15
St. Johns.....	1,200	26	15
Backeye.....	5,000	40	70
Peoria.....	35,000	6	90
Riverdale.....	1,500	8	15
Noonan.....	1,500	15	16
Citrus Belt.....	2,000	16	20
Agua Caliente.....	3,000	15	20
Castle Dome.....	3,000	.....	28
Agua Fria.....	.....	.....	.....
Rio Verde.....	.....	.....	.....

a Under construction.

Many smaller canals are owned and operated by individuals, covering many thousand acres, but of which at this time I have no accurate information. Roughly estimated, I place these lands under individual canals at 7,000 acres.

In this connection I regret to report that the unprecedented floods of 1895 carried away a large portion of the Peoria dam, and that the affairs of the canal company have been further complicated by litigation with the original promoters of this enterprise. It is rumored, however, that a compromise of all disputed rights is being effected, and that the company will immediately replace the broken section of the dam. This canal when completed will open to settlement (in the vicinity of Gila Bend) one of the most beautiful sections in the county.

RAILROADS.

The Southern Pacific owns and operates in this county 71 miles of its main line. It runs through the southern part of the county from east to west, and connects with Phoenix by a branch road known as the Maricopa and Phoenix, 34 miles in length.

The Santa Fe, Prescott and Phoenix, which connects with the Santa Fe Pacific at Ash Fork, owns and operates in this county 58.8 miles of its road. This road is soon to be extended to Florence, thence to Bisbee, on the Southern Pacific, where it will connect with the Sonora system of roads running to Guaymas. The Maricopa and Phoenix, and Salt River Valley, a short line about 9 miles in length, connects Tempe and Mesa City, making in all about 173 miles of railroad in the county, on 94 miles of which taxes are collected, the remainder being exempt under existing laws.

Preliminary work, looking to the construction in the near future of several other important and badly-needed lines of railroad, is being actively pushed forward by citizens of the county, notably the San Diego and Phoenix road, which has about 40 miles completed in this direction. No better field for investment of capital can be found anywhere than exists here in this valley, as production and population keep constantly in advance of carrying capacity.

COST OF RECLAIMING LANDS.

The amount of purchase money to the Government (\$1.25 per acre), the cost of clearing the land, and the incidental expenses of final proof and patent is about \$4.25 per acre. Twenty-five cents per acre to the Government, to be paid in cash at the time of filing, and the balance (\$1) at the time of final proof, is all the cash outlay required by the Government. The \$3 per acre remaining must be expended on the land—\$1 per acre each year to show good faith on the part of the entryman—and this may be done by clearing the lands, ditching, or in the purchase of water for irrigation.

Many of the canals rent to the farmer at a small cost the quantity of water desired. Many own shares in the canal under which their land is sustained, and do their own assessment work, while others own their shares and pay into the company fund each year a small sum per acre, to be used in keeping the canal in repair, etc.

Under all of the canals now being constructed, entrymen, if they wish to do so, can find work, and in this way secure water rights in such canals, and these water rights give them water for all time, under such rules and regulations as they (being members of the company) may from time to time adopt. All of the original settlers of this valley have secured their beautiful homes in this way.

The wages per day allowed for work of this nature, at this time, is as follows: Man, \$1.50 to \$2; man and team, \$3.50 to \$4. Laborers furnish their own teams, implements, and board. These prices prevail throughout the Territory for all ordinary work.

As every acre of irrigable land in this county is susceptible to the very highest state of cultivation for nearly the entire year, small holdings are advisable; 20 to 80 acres, according to the available force controlled by one family, is sufficient. This applies to agricultural pursuits. For cattle feeding and grazing, and for the exclusive growth of alfalfa and grain, hay, and such purposes, the acreage need only be limited by the ability of the parties who may wish to engage in such special agricultural lines.

IMPROVED LANDS.

As has been stated, improved lands in this county are mostly in a very high state of cultivation, and when offered for sale with water rights usually bring from \$30 to \$100 per acre, according to the improvements and location.

A conservative estimate of the yearly productive value per acre of some of these lands would stand about as follows: Alfalfa, \$30 to \$40; deciduous fruits, \$100 to \$200; strawberries, \$300 to \$500.

This much has been the yearly returns to many for many years past. Thus it will be seen that though improved lands in this valley are comparatively high, they are really very cheap when compared with the yearly returns of products. Lands held under the desert entry may be purchased at from \$3 to \$8 and \$10 per acre, according to location and extent of reclamation work done on the land.

DESERT ENTRIES.

Under the desert land act of Congress of March 3, 1877, as amended by act of 1898, a desert entry can be made only in Arizona by one who is at the date of entry a resident of the Territory. No particular prior duration of personal presence within the Territory, however, is necessary to constitute a former nonresident a resident of Arizona. Residence is largely a matter of intention.

These matters are mentioned here for the information of those in the older sections of the country who may desire such information or who may contemplate seeking homes in our midst.

HOMESTEAD EXEMPTIONS.

In answer to many inquiries concerning homesteads and homestead exemptions, the following statement is made:

Under Congressional enactments 160 acres of the public domain, not mineral, is secured to every head of a family who enters upon and occupies the same as a homestead.

Our Territorial laws are also liberal. Section 1, paragraph 2071, Revised Statutes, reads as follows:

"Every person who is the head of a family may hold as a homestead, exempt from execution and forced sale, real property to be selected by him or her not exceeding in value the sum of four thousand dollars."

Paragraph 1956, section 1:

"There shall be reserved to every family, exempt from taxation and execution, and every species of forced sale for the payment of debts, personal property not to exceed in value the sum of one thousand dollars."

ARTESIAN WELLS.

At Fort McDowell, an abandoned military post, flowing water has been obtained at a depth of about 500 feet, thus demonstrating the fact that anywhere in this valley flowing water can be obtained by skilled labor and proper tools and machinery. The advantage to be gained by proper efforts in this line are incalculable.

STATEHOOD.

Statehood for Arizona is the one great question on which the people of this county are united. However the powers that be may view this question, with them it is one

of paramount interest, upon which all political parties and all religious creeds are thoroughly bonded together, working in perfect harmony with the one end in view—the right to self-government; to direct their energies and the splendid opportunities that they have to the aiding to build here in Arizona a commonwealth which shall rank high among the States of the Union.

The Territory has the necessary population, wealth, and intelligence. No good reason, therefore, can possibly be given for subjecting her people longer to a Territorial form of government.

MOHAVE COUNTY.

Mohave County lies in the northwestern corner of the Territory, and is one of the original four political divisions into which Arizona was divided. The Colorado River flows along its western border for over 200 miles in a southerly direction. On the west it is bounded by Nevada and California, on the south by Utah, on the east by Coconino and Yavapai counties, on the south by Yuma County, Ariz.

It is traversed by high mountain ranges and broad valleys covered by nutritious grasses. Since 1860 it has been the scene of active mining operations. The Colorado River until 1882 was the only means of communication with the outer world. The river boats connected with the coast steamers at Port Isabel, on the Gulf of California, and it usually took six weeks to make a trip to San Francisco. Since the construction of the Santa Fe Pacific Railroad mining developments have been more active, and to-day the county is one of the largest producing gold and silver counties in the Territory. The county has an area of 16,000 square miles, and its population is 2,500.

LANDS.

The number of acres of land now under cultivation is 2,000, and fully 1,000 more are in progress of reclamation.

The irrigation canals of the county are purely of a lateral nature, built to carry water over small sections of land. On the Big Sandy each farmer has taken out a ditch from the creek to irrigate his own tract of land, consisting of from 50 to 300 acres. Thirty-five miles of ditch will cover the irrigation district of the Sandy. In the valley of the Colorado the Government has a pumping plant which supplies water for about 100 acres of land. Several ranchers irrigate small parcels of land from wells, while the Mohave Indians await the overflow of the river to put their land in proper condition for crops.

LAND RECLAMATION.

There are in the county of Mohave, not including the mesas, over 4,000,000 acres of land that can be easily reclaimed. Lands along the Colorado River, in the Mohave Valley, grow every semitropical fruit. No frosts fall on the lowlands. In the mountain range are many springs, the waters of which are used to irrigate small patches of land. West of Kingman several of these springs have been converged at the Beale Springs, and a beautiful fruit orchard propagated. This year the crop has been unusually large, and thousands of dollars' worth was shipped to outside points. The peaches raised on this ranch are of the most luscious flavor, and are of enormous size. North of this ranch is Oak Creek, the largest orchard in the county. Nectarines, peaches, apricots, figs, apples, pears, plums, pomegranates, almonds, grapes, and many other fruits are here grown in abundance.

LIVE STOCK.

The live stock interests of Mohave County are decreasing year by year, although this is really the best part of Arizona for the propagation of range stock. The assessment roll shows only 20,798 head of cattle, as compared with 26,000 in 1896. Nevertheless the cattle shipment from the county exceeds the number shown on the roll.

MINING.

The people of Mohave County depend almost entirely upon the products of the mines. For years the mines were worked almost exclusively by the "chloriders," and the product has been enormously large. Forty million dollars will not cover the value of gold and silver taken from the mines since their first discovery. Since the discovery of the mines in White Hills, in 1892, many mining companies have invested in mines and have expended thousands of dollars in development. Notably is this the case at White Hills, where an English company, after paying \$1,750,000 for the White Hills group of mines, has expended over \$500,000 in developing water and blocking out ore bodies in the mines. A 40-stamp combination mill has been built,

through which all the ores of the district will be run. At Chloride a Scotch syndicate has just completed a 100-ton concentrating plant to put the ores of the Elkhart mine in a more marketable condition. New hoisting plants have been put on the lead groups at Chloride, and seven hoists are in operation at White Hills. At Cubat, Lane and Howard, the millionaire gold miners of California have bonded a gold property and have a shaft on it 200 feet deep. The ore body is immense and averages over 5 ounces of gold to the ton. On Union Basin the same parties have bonded a claim which shows an ore body of 45 feet in width. The parties propose to erect a large reduction plant on the rim of the Sacramento Valley, where the ore from both mines will be milled.

On the Colorado River north of White Hills a French exploration company is putting in an immense hydraulic plant for the purpose of working the rich auriferous gravel banks along the river. South of Kingman, at Cedar, an Eastern company has a 15-stamp mill running on paying ore. A few miles south of Kingman a district rich in gold is being opened up, and several small mills will soon be erected for the reduction of the ores. The dry placer mines of the Chemehuevis Mountains continue to add thousands of dollars annually to the wealth of the world. In Todd Basin, 16 miles north of Kingman, the Oro Plato mine, with a big hoist and twenty chloriders, is turning out about \$10,000 in gold per month. South of Chloride the Comor Minnesota mines are producing heavily.

Three mountain ranges traverse the county from north to south, and their rocky ribs are seamed with ledges of gold, silver, copper, and lead. Near Mineral Park are many ledges of turquoise which show evidence of having been systematically worked by a prehistoric race. Stone hammers and rude tools have been found in all the openings in the mines. For the year ending June 30, 1897, the ore shipment through the Kingman Sampling Works and to the smelters, and bullion by express, is valued at \$1,250,000. Shipments of lead aggregate over 200 tons.

CLIMATE.

The climate of Mohave County is indeed delightful. In the mountains it is cool and exhilarating during the summer months, while in the valleys it never becomes oppressively hot. For an all-year-round climate it surpasses anything in the world, and some day in the not distant future it will be a resort of invalids from all parts of the country.

AGRICULTURE.

The amount of barley produced for the year ending June, 1897, was 300 tons; wheat, 100 tons; corn, 10 tons. On the Big Sandy and in many parts of the county a good business in the culture of bees has sprung up in recent years, and now there are over 800 stands.

HORTICULTURE.

In bearing orchards there are 40 acres in the county. The fruit is so well known that it readily sells in outside markets at prices far in advance of the California products. Seven cents per pound is realized from the fruit delivered at Kingman. Peaches, figs, apricots, apples, nectarines, and grapes bring the same price. Little patches of land in the vicinity of villages net the owners enormous profits.

SCHOOLS.

Mohave County boasts of more schools to the population than any other county in the United States. Wherever the necessary number of children can be found, there will also be found a school. There are 14 school districts, with 15 teachers. Kingman has just completed a handsome brick schoolhouse capable of accommodating 200 children. Hackberry also has a good school building.

CHURCHES.

There is but one church in the county, and Kingman is the proud possessor of that one.

NEWSPAPERS.

There are two papers published in the county, The Mohave Miner (Independent) and Our Mineral Wealth (Populist).

HOTELS.

There are 14 hotels and 18 saloons in the county.

UNDEVELOPED RESOURCES.

We would call the attention of our Chief Executive, and through him the Interior Department, to the great undeveloped wealth of our valleys, rich in nature's fertile soil, only awaiting the moisture of our mountain streams to make them yield a golden harvest. Mountain gorges there are in which to impound the flood waters sufficient to irrigate thousands of acres; and, were this not feasible, there runs through our northern border one of the mightiest streams of the continent—the great Colorado of the West.

The water runs through the canyon like a tailrace, and will generate millions of horsepower, and this power can be used in pumping water onto the uplands.

Capital to carry out this immense project is all that is necessary to develop these millions of acres.

Wallapai Valley is overrun with the canaigre plant, and a factory to extract the tannic acid could be carried on successfully. Another industry that could be carried on successfully is the production of cement from the immense gypsum beds along the Colorado River northwest of Kingman. Tanneries could be run successfully at any town along the line of the railroad.

STATEHOOD.

Our people are a unit in favor of statehood.

In conclusion, I would say to the worker that Mohave County offers an excellent field. In no place is the labor of the farmer, mechanic, or miner better repaid than here. There are thousands of mines open to location in our mountains, while our valleys are rich and unsettled.

NAVAJO COUNTY.

Navajo is the youngest county in Arizona. It was created out of the western part of Apache County in 1895 by an act of the legislature. It takes in a part of the high table-lands of northern Arizona, which break off into the Grand Canyon of the Colorado, extending south across the Little Colorado into the Mogollon and White mountains. It is about 240 miles long from north to south and 53 miles from east to west, containing about 10,000 square miles, or about one-tenth of the total area of Arizona. The whole of the northern portion is occupied by the Moqui and Navajo Indian reservations, while the southern portion includes the White Mountain Indian Reservation.

The county proper is about 100 miles long from north to south and 53 miles from east to west, covering an area of 5,000 square miles. It is bounded on the north by Utah, and on the east by Apache County, on the south by Graham and Gila counties, and on the west by Gila and Coconino counties. The average elevation is about 5,000 feet. The great farming portions will be confined to the Little Colorado Valley and its tributaries south and north, as that part is better watered and presents more natural advantages for building and operating storage reservoirs, while the other portions, with the exception of an occasional ranch and settlement, will forever remain a grazing country, over which will roam the thousands of head of sheep and cattle.

The topography of the county consists of broad valleys, rolling low mesas, and mountains, the elevated southern portion being covered with a luxuriant growth of pine timber, interspersed with oak, pinion, etc.

The soil consists of sandy loam, gravel, clay, and black loam, all rich and fertile wherever water can be applied, and produces alfalfa, wheat, barley, oats, rye, corn, potatoes, peas, beans, and vegetables of every description, and fruits of the hardier varieties. Navajo County is therefore preeminently an agricultural and grazing section. Its main wealth will be found in its rich soils and its herds of cattle and sheep. Throughout all portions of the county can be found magnificent reservoir sites where water can be impounded and utilized for irrigation purposes. In addition thereto are numerous dry washes, where great quantities of water rush down at certain seasons of the year, and which also have a large underflow a few feet below the surface. This underflow can be brought to the surface by building submerged dams. There are at least 400,000 acres of choice land which in this manner could be reclaimed at a small cost, not to exceed from \$1 to \$2.50 per acre, and furnish homes for 7,000 to 8,000 families. Artesian waters have not yet been developed, but are believed to exist.

MINERALS.

So far no paying mines have been discovered, although gold and silver bearing quartz have been discovered in a number of places. Immense deposits of gypsum and building stone are found along the Little Colorado Valley, and in Holbrook and Winslow brick have been made that rival the famous Milwaukee product.

TOWNS AND POPULATION.

Navajo County has a population of about 5,000. Its principal towns are Holbrook, Winslow, Snowflake, Woodruff, Taylor, and St. Joseph. In 1898 the assessed valuation of property was \$1,234,061.43, while the actual value was estimated at \$2,750,000. During the same year there were produced 30,000 bushels of wheat, at \$1.20 per bushel; 10,000 bushels of oats, at 60 cents per bushel; 12,000 bushels of corn, at 80 cents per bushel; 8,000 tons of hay, at \$12 per ton. About 70,000 head of cattle are ranging in the county; also 130,000 head of sheep, 75,000 head of horses, and 1,600 head of swine.

Dairying interests are becoming important and bee culture has come to stay. The Santa Fe Pacific Railroad crosses the county from east to west. At Ash Fork it connects with the Santa Fe, Prescott and Phoenix Railroad for points south, giving the section an outlet by rail to all points south, east, and west.

MANUFACTORIES.

Navajo County offers excellent facilities for various kinds of manufactories, such as wool-scouring plants, woolen mills, tannery, and a beet-sugar factory and canning factory. The raw materials can be produced in abundance, water power can be easily obtained, and fuel is within easy reach.

CLIMATE.

The climate is mild; the altitude tempers the summer heat while the southern latitude exempts us from the severities of the winter. The extreme heat is never more than 105° above zero nor the extreme cold greater than 5° below zero. The dryness and lightness of the atmosphere render the heat or cold less severe than in lower altitudes. Few places can be found possessing a more delightful climate. To those who are suffering from diseases of the lungs and throat it seems to be a specific. Wonderful cures have been effected by nature's own remedy. Many over whom have settled the shadows of wrecked constitutions have found the secret of renewal in the pure mountain atmosphere, the rich blue of the cloudless sky, the perfect nights, sunlight and moonlight, and the bracing atmosphere lulls a mortal to refreshing slumber, all conspiring to charm back the failing strength whose departure brings life's heaviest burdens.

The traveler, the tourist, the student, and the curio seeker on no place of the globe can find so many wonders that furnish food for reflection and meditation. It is the sportsman's paradise. In the cool shade of the stately pines, in the White Mountains, where the crystal water bubbles in profusion from numerous springs, he finds abundance of game, such as deer, antelope, wild turkey, and different kinds of bear, while all kinds of small game are met with. In the White River is the best fishing in the West, surrounded by stupendous and picturesque mountain scenery.

Southeast of Holbrook is the wonderful petrified forest, the strangest natural wonder on the face of the earth, and northwest of Holbrook the Painted Desert. All over the country are found prehistoric ruins, ineffaceable monuments of civilization buried in the gloom of the silent past. Again north of Holbrook are the Moqui villages, which yearly attract hundreds of visitors to witness the "snake dance," held by those untutored sons of the wilderness to pacify the wrath of their gods, thereby insuring the return of rains and abundant harvests to the children of the Moquis.

HOLBROOK.

Holbrook is the county seat of Navajo County, and is located on the Santa Fe Pacific Railroad, about 250 miles from Albuquerque and 635 miles from Los Angeles, and in the fertile valley of the Little Colorado. It is the distributing point for northeastern Arizona. Immense quantities of freight move out from here in every direction. During the year of 1897 about 600 cars were shipped out and about 400 received. Four stage lines start from the town, one going to Concho, St. John, and Springerville, and into New Mexico, one to Fort Apache, and another to Heber and the Tonto Basin, and one to Kerns Canyon.

Up to July 1 about 12,000 head of cattle and 25,000 head of sheep had been shipped this season, and about 500,000 pounds of wool.

It is the supply point for Apache County and northern Gila County, besides Woodruff, St. Joseph, Taylor, Snowflake, Shumway, Linden, Pinedale, Heber, Showlow, Pinetop, and Fort Apache.

The town has a graded school, a public hall, hotel, and several restaurants, and all lines of business are well represented. An elegant court-house and jail is under construction, the stone being quarried near town and the brick made within a block of the building. The structure will cost \$12,000 and will be a credit to northern Arizona.

About 7 miles southeast of the town the Little Colorado River flows through a large basin, passing out at the lower end through a narrow gorge. By building a dam about 200 feet long across the mouth of the canyon, a reservoir 4 miles long and 2 miles wide, with an average depth of 20 feet would be created, containing enough water to reclaim 120,000 acres of choice farming lands. The cost of building has been estimated by a competent engineer at \$83,000, or about 70 cents per acre. Several other places present natural advantages for storing water, which will be utilized in a few years. The Little Colorado is spanned at Holbrook by a magnificent wagon bridge. Few places have brighter prospects for the future than Holbrook.

WINSLOW.

Winslow is the largest town in the county, and has a population of about 1,200. It is a passenger and freight division of the Santa Fe Pacific Railroad. It has one of the finest public school buildings in northern Arizona, a magnificent Harvey House, and depot, roundhouse, machine shops, railroad, carpenter, and blacksmith shops. It has several first-class hotels, stores, and all lines of business are well represented. The population is intelligent, pushing, and energetic. A large number of houses are under construction, building stone is close at hand, and brick of the finest quality is made right in town. Good water is obtained from Clear Creek through a pipe line 4 miles long. Surrounding the town are several well-improved farms, being watered from Clear Creek.

The railroad employs a force of about 400 men in the various departments, and their pay roll aggregates over \$30,000 per month. The Farm and Fireside Irrigation Company are now at work completing a comprehensive irrigation system which consists of damming Canyon Diablo and pouring its waters into Hoy Lake. Hoy Lake itself drains a large scope of country. Another dam will be built at Hoy Lake, storing enough water to reclaim 15,000 acres of land. The water from here will be drawn off through Jock's Canyon, and a diverting dam built 6 miles from Winslow, with a distributing reservoir 2½ miles from town. This will make a total of about 15,000 acres of land under cultivation in and about Winslow, and possibilities of greatly increasing the acreage in the future. The future of Winslow is bright and it promises soon to become the largest town in northern Arizona.

ST. JOSEPH.

This prosperous little hamlet is located between Holbrook and Winslow, on the Santa Fe Pacific Railroad. The chief occupation is agriculture; about 500 acres are under cultivation. Crops of all kinds are raised; fruits also do well. The water for irrigation is taken from the Little Colorado River in a ditch 9 miles long, with 5 miles of laterals. Between Holbrook and St. Joseph is an immense stone quarry, where Langtry & Son have a large force of men at work, and building stone is shipped to many points of the East and West.

WOODRUFF.

This is another prosperous little town, situated about 12 miles southeast of Holbrook, on the Little Colorado River. Five miles of main ditch and 6 miles of laterals convey and distribute the water to their tillable lands. A bridge is being constructed across the river at this place. The soil is productive, and all kinds of grain, vegetables, and fruits are produced.

SNOWFLAKE.

Snowflake is located 30 miles south of Holbrook, and is the second town of size in the county. Its population is about 1,000. It is surrounded by an exceedingly fertile farming country, producing all kinds of cereals, vegetables, and fruits. The town is handsomely laid out, with broad streets fringed with beautiful shade trees. The thrift of the population is amply attested by the numerous elegant brick residences that adorn the town, and the well-cultivated fields surrounding it.

South of town is a large storage reservoir connected with a chain of reservoirs and ditches. The town has a fine church building, a fine schoolhouse, graded school, a public hall, etc.

TAYLOR.

This town is situated about 3 miles from Snowflake, and its inhabitants depend upon agriculture. The town is growing rapidly. Snowflake and Taylor are both irrigated through the same system of canals. They have three large reservoirs in use, and three more are constructed, but the necessary feeders have not yet been completed; when completed the system will water about 25,000 acres. The length

of the main canal in operation at present is 25 miles and 40 miles of laterals. The water is taken from Silver Creek and Showlow Creek.

SHUMWAY.

About 10 miles northeast of Snowflake is Shumway, located on the banks of Silver Creek. It is a thrifty village, and is an ideal fruit section. At this place is located the A. C. M. I. flouring mill, which is doing an immense business.

PINETOP.

Nearly 30 miles from Snowflake is Pinetop, a village clustered among the stately pines, on the crest of the Mogollon Mountains. It contains two sawmills, and surrounding it are numerous sheep and cattle ranches. Pinetop and vicinity and on south to the White River furnishes summering places for tourists and sportsmen. Many people spend weeks at a time camping out in these magnificent camping grounds.

SHOWLOW.

Twenty miles from Snowflake is Showlow, watered by the Showlow Creek. The settlement is scattered along the creek for several miles. It is one of the most beautiful spots in the country. Several fine sheep and cattle ranches are found in this vicinity.

FORT APACHE.

One hundred miles due south of Holbrook, on the White River, is Fort Apache, a military post on the Apache Indian Reservation. Several companies of cavalry are stationed there. The post is well and substantially built, and is one of the most picturesque spots in the West.

PINEDALE.

Eighteen miles south of Snowflake is Pinedale. It has a sawmill and is surrounded by numerous farms. Along the entire range of the Mogollon Mountains splendid crops of corn and grain are raised without irrigation. Numerous sheep and cattle ranches are scattered throughout the section. Linden is another village near Pinedale, and Heber is the most southwestern town in the county.

IRRIGATION.

Throughout the entire county are reservoir sites which at a small cost will store water for irrigation purposes. All over the county are dry washes, which at certain seasons carry an immense quantity of water, and when apparently dry carry a heavy underflow. A submerged dam will bring the underflow to the surface and utilize it during all seasons, while its flood water can be stored up in reservoirs. There are at least 400,000 acres of land which can be reclaimed in this way at a very low cost.

This land will produce from three to four crops of alfalfa each year, wheat, barley, oats, corn, rye, sugar cane, sugar beets, all kinds of vegetables, and peaches, pears, apples, apricots, plums, prunes, cherries, and all kinds of berries. It is an ideal climate and soil for the production of sugar beets. There is plenty of room for 6,000 to 8,000 families. The land consists of broad valleys, low rolling mesas, and mountains. The northern part is covered with magnificent pines, pinons, oaks, etc. Coal is extensively mined on the borders of Arizona and New Mexico and sold at reasonable figures along the railroad line.

EDUCATION.

The school year ending June 30, 1898, showed 855 children of school age. There were fifteen school districts, in which 21 teachers were employed, at an average salary of \$67.40 per month for male teachers and \$58.12 per month for female teachers. The average length of the school term all over the county was a trifle over six months. Of the teachers in the county 10 are graduates from normal schools, 3 hold educational diplomas, 11 first-grade county certificates, and 7 second-grade county certificates.

CHURCHES.

There are eight churches in the county.

PRESS.

Two newspapers are published in the county, the Mail at Winslow and the Argus at Holbrook.

HOTELS.

Ten first-class hotels are running and about double the number of restaurants. There are only nine saloons in the county.

GENERAL STATISTICS AND REMARKS.

The population for the year ending June, 1898, was about 5,000, an increase of about 500 for the last year. The value of the taxable property, real and personal and mixed, was assessed at \$1,234,061.42, while the actual valuation is estimated at \$2,750,000. The rate of taxation is \$3.50 per \$100. About 1,000 acres of land were reclaimed last year, while work is now in progress to reclaim about 20,000 more during the coming year. This year there has been already shipped from the county 15,000 head of cattle, 70,000 head of sheep, and 1,000,000 pounds of wool. Navajo County offers numerous advantages to the home seeker and the investor, and the future prospects of the "baby county" are indeed gratifying.

PIMA COUNTY.

The county of Pima had greater prosperity during the years 1897-98 than for any year since the great mining excitement incident to the discovery of the rich silver mines near Tombstone in the early eighties. One of the chief sources of this prosperity has been the increased demand and, consequently, higher price for cattle.

Prime steers that three years ago would not bring over \$10 or \$12 per head are now readily bringing from \$18 to \$20, and all lower grades of cattle are bringing correspondingly increased prices. Owing to the low prices during the few years prior to 1897-98 the ranges were stocked to the full extent of the food supply, but the recent demand at good prices has induced our cattle dealers to dispose of vast herds of beef and stock cattle, so that to-day our cattle kings not only have large bank accounts by the sale of cattle, but also have better ranges than for years past. The sale of surplus stock has lessened the consumption of range pasturage, and left the stock in the vast cattle plains of Pima County with a much better food supply, which with the bountiful rains of the past summer, gives the promise to keep up for some time to come. The ranges to-day are covered with grass knee high, which will more than supply the stock now running on them during the coming winter with plenty of food.

The reports from all round-ups are that the past season has been bountiful in calves, and therefore the prospects for a large stock of good beef cattle for the coming years are better than they have ever been in the history of Pima County, and that is saying a great deal, as Pima County has always been famous for the abundance and quality of its beef cattle. In the past year the sale of stock has reached the unprecedented amount of \$1,500,000, and enabled our stock raisers to pay off their debts, improve their buildings, develop water by digging wells, building reservoirs for impounding water, and otherwise increasing their facilities for producing more and better cattle at less expense than heretofore on the same ranges, while the value of ranges has increased by the development of canals where cattle could not thrive heretofore for want of sufficient water. There is no industry in the country that gives greater promise of ample and early rewards than the raising of horned stock.

The large herds of horses that formerly roamed over the plains of Pima County have to a great extent disappeared and left the pasturage to horned stock. The reason for this is that the introduction of electricity as a motor power for street cars, instead of horses, and the universal use of the bicycle, which has largely taken the place of private and public conveyances previously drawn by horses, has relegated the horse to the background to such an extent that horse raising is no longer a profitable business.

In years past an unbroken horse just caught on the range would bring twice as much as a beef steer, and it cost about as much to raise a steer as it did to raise a horse.

But the reverse is the case now. A good beef animal will bring three or four times as much as the average unbroken horse. Any reasonable amount of horses could be bought to-day for from \$5 to \$6 per head running on the ranges, and the choice out of hundreds could be bought from \$10 to \$15 per head. The day for horse raising is past in Pima County, and the day for raising good beef stock is in its zenith.

Considerable attention is being given to the larger production of sheep in the mountain ranges than heretofore, both on account of the higher price of wool, incident to the passage of the late tariff legislation by Congress, and the greater demand for mutton as an article of food, owing to the increased price of beef cattle.

The great mountain ranges of Pima County are especially fitted for the support of immense flocks of sheep; they produce large quantities of the most nutritious grasses,

which are not as accessible to the larger stock as to sheep. This field of sheep industry presents a decidedly inviting opportunity for the employment of capital with the most profitable results. This is especially so for the person with limited capital, as it takes much less capital to start into sheep raising than it does in cattle raising, while the returns in sheep are much earlier than with cattle.

MINES AND MINING.

While silver mining, which was an important industry and source of profit in the county of Pima in the past years, has largely decreased, yet there are a number of silver and lead properties still being worked at a profit, while gold and copper mining has more than doubled in the past year. The former silver miners and prospectors have yielded to the inevitable in the fall of silver, and with a good grace turned to the development of the immense rich gold and copper bearing ledges and veins that abound like a network through Pima County.

The production of gold has perhaps doubled in Pima County during the past year, while copper has maintained a good second, and silver and lead have not fallen off, but have more than held their own as compared with the previous two or three years.

There are vast deposits of iron, marble, lime, and onyx in Pima County, but none of them are being worked to any extent owing to the cost of transportation to a market.

There are now at least 250 gold, copper, silver, and lead properties being worked to a profit in Pima County, as compared with about 175 a year ago. The output of gold and silver bullion and placer gold, together with copper and lead, during the past year has increased from about \$250,000 to \$400,000. The work done on old properties has more than doubled within a year, while the large number of new properties opened within a year have made marked progress toward paying development.

A few among the most promising new properties are the Rosemont copper plant, the Columbia silver and lead plant, and the Saginaw gold, silver, and lead plant, the latter within about 7 miles of Tucson. All of these properties are in a most promising condition and give prospects of yielding rich returns to their owners. There are 31 mills representing about 250 stamps, several concentrating and cyanide plants, and 4 smelters now in successful operation in Pima County, while large amounts of high-grade ores—gold, silver, and copper—are being profitably shipped to outside plants for treatment.

Oro Blanco, Arivaca, and Guigas are the chief gold-ore mining districts, while Greaterville and the Canada del Oro Quijotoa are the chief gold placer districts. Oro Blanco and Arivaca, have been worked ever since the early days of the Spaniards. The chief copper districts are Ajo, Washington Camp, Duquesne, Rosemont, and Twin Buttes, while silver and lead are found in nearly every mining camp in the county in more or less quantities. There is scarcely a point in Pima County in which gold, silver, copper, or lead are not found, and frequently all of these metals are found in paying quantities in the same locality.

The principal seats of population and business in Pima County are Tucson and Nogales.

Tucson is perhaps the oldest place in the United States settled by Europeans or their descendants. Santa Fe, N. Mex., and St. Augustine, Fla., dispute precedence with Tucson as to early settlement, but it is believed that Tucson is the oldest of the three early Spanish military posts. In population Tucson is the second largest city in Arizona, while in number of children attending the schools, it outranks for population any city in the Territory. Commercially and financially it leads all other places in Arizona. The banks make a better showing than those of any other place in the Territory. The combined deposits in the Tucson banks amount to over half a million dollars, the exact figures being \$518,425.74, nearly as much as deposited in all the other banks of the Territory.

The cash resources of the Tucson bank on May last, according to the report made to the comptroller, was \$399,799, while the national banks in Phoenix and Prescott combined, only showed cash resources of \$402,030. These figures show the financial stability of the Tucson people, and show that the "old pueblo" is solid; and more, the conditions show that this is one of the best localities for business in the Territory.

The wealth of Tucson represents the steady accumulation of the merchants, mechanics, and shopmen. No outside capital has ever been loaned here for any kind of improvements. No one brought any money when they came to Tucson; what they now have was made in Tucson. The public records show but a small percentage of mortgages on record, and notices of sheriffs' sales in the local newspapers are scarcely ever seen.

The increase in taxable property in the city of Tucson for 1897 amounts on the tax roll to \$149,720.

The climate for healthfulness is unsurpassed in the world.

The machine shops, roundhouses, freight depot, hotel, and offices of the Southern Pacific Railroad for the division of the long stretch between El Paso, Tex., and Yuma, on the border of California, are located at Tucson. Almost \$80,000 a month is paid in wages to the employees of the company on this division, about \$60,000 of which is spent in Tucson, and goes to augment the monthly transactions.

The mountain town of Nogales, on the international line, between Mexico and the United States, is a wide-awake, progressive city, that has advanced as much in business and substantial improvements as almost any point in the Territory. Until recently the town of Nogales has been claimed to be located on one of the land grants which has heretofore stood in the way of its development, but the recent decision of the land court has cleared the cloud from the title to the land on which it stands, and the effect has been magical. Substantial and costly business buildings, commodious and comfortable homes, and new business undertakings, at once sprang into existence, and Nogales is more than keeping pace with the advancing column of progress. In her social advantages, churches, schools, and other evidences of civilization, Nogales has little of the border town, but much of the cosmopolitan.

PUBLIC SCHOOLS OF PIMA COUNTY.

The first law for establishing public schools in Arizona was passed in 1867. It was amended by the law of 1868 and greatly improved by the law of 1871.

The first public school in Pima County, and probably the first in Arizona, was opened in Tucson the spring of 1869 with an enrollment of 59 boys. By 1872 the enrollment had increased to 138 boys, nearly all of whom were of Spanish parentage. In 1872 the first public school for girls was opened.

In 1883 the city of Tucson exhibited its claims to educational leadership by securing from the legislature the right to issue bonds to the amount of \$40,000 to erect a modern public school building, the first in the Territory. The same year a regular course of study was adopted, the school arranged in grades without respect to sex, and coeducation was started on its work in the old pueblo.

The enumeration of school children in this district has risen from 1,330 in 1885 to 1,853 in 1897.

Among the earliest public schools outside of Tucson were those of Harshaw, La Noria, Tubac, Oro Blanco, Arivaca, Greaterville, Calabasas, San Xavier, Crittenden, and Nogales. During 1896-97 there were employed in Pima County 42 different teachers for 31 different districts for periods of from five to nine months, at salaries from \$50 to \$125. Of the teachers employed six were graduates of State normal schools, and as many more held educational diplomas in Arizona.

The average school for the entire county was $6\frac{1}{4}$ months. The schools of the county enrolled 1,833 pupils out of a census enumeration of 1,934. Twenty-one schools are classed as primary and 15 as grammar schools. Of the pupils, 1,300 attend primary schools and 521 grammar schools.

The district of San Xavier, with 2 teachers, and Nogales, with 3 teachers, are the only graded schools of the county outside of Tucson.

The rate of county taxation for school purposes for 1896-97 was 62 cents on \$100. The various districts have been able to accumulate property to the value of \$87,960. During the school year there was received by the treasurer of Pima County for public schools the sum of \$29,389.03, of which \$27,097.55 was disbursed, leaving a small balance to the credit of the fund.

The schools of the city of Tucson employ 12 grade teachers and a principal. During the past year the schools have been further graded and adjusted to a course of study with all modern requirements. This course covers a period of eight years, and embraces as studies spelling, reading, writing, geography, grammar, composition, American literature, United States history, civil government, physiology and hygiene, geometry, drawing, and vocal music.

The completion of this course prepares students for admission, without examination, to the first year of the Territorial Normal School, and to second year preparatory to the Territorial University.

According to the plan now in force each pupil received one hour's instruction each week in drawing, penmanship, and music under special teachers, who have made careful preparation for such work. For the coming year the corps of teachers is a superior one, containing eight graduates of State normal schools and the remainder graduates of well-known institutions.

At least three-fourths of all pupils in attendance can speak Spanish. With such an opportunity no pupil need complete a course without having acquired a working knowledge of this beautiful and useful language. There is probably no climate in the world where a pupil can attend school with so little reason to complain of inclemency of the weather. The school buildings are large and commodious and well located, and furnished with many of the best and latest appliances. We have no doubt that in the near future steps will be taken to inaugurate, in connection with the public schools here, kindergarten and manual-training departments.

Eastern people who desire to locate in or near the cities of Arizona will find our schools equal or superior to those of their old homes. Those who wish fuller information in regard to the Tucson schools should send to the clerk of the board of school trustees for the annual report.

PRIVATE SCHOOLS.

	Pupils.
Academy of St. Joseph's at Tucson.....	125
Parochial school (Catholic), Tucson.....	445
Orphans' Home (Sisters of St. Joseph), Tucson.....	24
Methodist Seminary, Nogales.....	70
Other private schools in Tucson and Nogales.....	40

TUCSON INDIAN INDUSTRIAL TRAINING SCHOOL.

The Tucson Indian School, which is situated within the limits of Tucson, is supported by the Presbyterian Board of Home Missions.

Seventeen acres of land have been leased from the city, on which have been erected 9 buildings for the accommodation of the teachers and pupils. The estimated value of the school property is \$25,000. Eleven teachers and helpers have charge of the different department work. The chief aim of the schoolroom work is to give the Indian boys and girls practical knowledge of the English language. They are taught reading, writing, and spelling, United States history, geography, arithmetic, and physiology. Both boys and girls are required to work a part of each day. A practical knowledge of farming by irrigation will certainly result in good to the Indians of this section. The girls are taught to sew, wash and iron, cook, and do general housework. A number of the girls are also taught in instrumental music. The school farm lies in the Santa Cruz Valley and contains 42 acres, all in cultivation. In addition to this, from 50 to 100 acres are rented each year to give employment to the boys. The average attendance last year was 125—47 girls and 78 boys. School opened in September, 1897, with an attendance of 160 pupils. Frazier S. Herndon is superintendent.

CHURCHES.

Catholic, Methodist, Episcopal, Congregational, Presbyterian, and Baptist denominations all have churches in the county. The Roman Catholic and the Episcopal churches, of the several denominations having the most wealth, have reared most costly edifices of worship. San Augustine's Cathedral in Tucson is without an equal in the Territory. It was erected in 1896 at a cost of about \$40,000. The Catholics and Methodists predominate.

SECRET ORDERS.

Masons (including blue lodges, chapters, and commanderies), Odd Fellows, Knights of Pythias, Workmen, Woodmen, and Good Templars flourish in the various towns of the county. Within the past year the Masonic fraternity has erected a fine hall in Nogales. The same order in Tucson has a magnificent building under way. The Workmen have been particularly prosperous in Tucson, and a hall is now in course of construction that will cost about \$25,000.

BUILDING AND LOAN ASSOCIATIONS.

The building and loan associations, two in Tucson and one in Nogales, have done much to advance the prosperity of these two towns. The two Tucson associations are probably without peers in the history of such organizations. They have been wisely managed, and while during the past ten years probably \$175,000 has been invested in buildings the amount of property which has reverted to the association will not exceed 7 per cent, and this property is by no means to be considered a burden, as it consists of desirable residences, for which there is a constant demand at a rental more than sufficient to pay interest, insurance, repairs, etc.

PRESS.

The Citizen, daily and weekly (Republican), Tucson; Star, daily and weekly (Democratic), Tucson; La Luz, Spanish weekly (Democratic), Tucson; Oasis, weekly (Republican), Nogales, and the Border Vidette, weekly (Democratic), Nogales, constitute the press of the county at present.

TAXABLE WEALTH.

All sources:

1898	\$3,753,240
1897	3,553,396
Increase over last year	199,844

WATER SUPPLY.

The running bodies of water are the Santa Cruz and San Pedro rivers and the Pantano, Rillito, and Sonorita creeks. During the rainy season immense bodies of water flow to waste, which, if impounded, would bring thousands of acres of the most fertile land in the world under cultivation. In any of the valleys and on the plains where flowing water can not be found the same can be reached at a depth varying from 10 to 600 feet.

COUNTY LANDS.

	Acres.
Total area	6,714,000
Surveyed lands	1,147,349
Unsurveyed lands	5,279,328
Unappropriated lands	6,426,677
Reserved lands	197,414
Disposed lands	89,909

Twenty per cent of the land of Pima County can be successfully irrigated and reclaimed by a system of ditches, subdrainage pipes, and reservoirs for water storage at a reasonable outlay, and 201,420 acres thus added to the cultivable area at an average cost of reclamation of \$6 per acre. Wheat, barley, oats, alfalfa, hay, corn, sorghum, tobacco, potatoes, peas, beans, beets, all kinds of vegetables, fruit, etc., can be produced on these lands. The yield of wheat, barley, and oats will be from 35 to 40 bushels per acre, corn from 40 to 60 bushels, hay 3 tons, and alfalfa 5 to 7 tons.

ORCHARDS.

There are 650 acres of land devoted to orchards—peaches, apricots, nectarines, apples, pears, quinces, figs, pomegranates, and grapes being the most profitable crops. Only about 10 per cent of the present fruit product is produced in the county.

AGRICULTURE.

The Santa Cruz Valley, which extends from south to north through the entire county, was undoubtedly the first seat of agriculture in the Territory of Arizona. The old settlements of Huebabi, Tumacacori, Tubac, Tucson, and San Francisco maintained a considerable population and supplied the Spanish military post with provisions by agriculture in the earliest dawn of civilization on the American continent, and the descendants of these early producers, augmented by more recent settlers, still carry on a successful agriculture at all these points and at many new places, until agriculture has become an important industry.

For more than three hundred and fifty years, ever since the Spanish first set foot in this country, crops have been produced in the Santa Cruz Valley every month in the year, with irrigation and without a particle of fertilizer being used, and still the soil is rich and abundantly productive, and the soil annually grows richer from irrigation. Two crops are raised on the same land each year.

Because of its antiquity there are a great many places of interest within a radius of a few miles of Tucson—notably the San Xavier mission, the old mission church of the Escala Pura, and the abandoned Government post, Fort Lowell, and the fortified hills west of the town. By whom or by what race the fortifications were built is not known, but their lines of defense are still plainly visible. Many large rocks having an eastern face are covered with hieroglyphics of a lost race, and the riddle has yet to be read. For many miles north of town in the Santa Cruz Valley are to be found evidences of dead cities. The plains may bear no mark of human occupation, but relics of the past are unearthed by a little labor. Broken pottery, ornaments, household utensils, implements of agriculture and war, are common to the inquiring mind of the archæologist. Buried urns and their incinerated treasures, perfect as the day they were first consigned to the earth, are occasionally to be found. The whole country is full of interest, not only for the capitalist and the home seeker, but for men of leisure in search of recreation and the invalid in search of health.

PINAL COUNTY.

By Commissioner Charles D. Reppy, Florence.

Pinal County during the past year has been blessed with unusual prosperity, its assessed valuation showing a large increase over the preceding year.

TAXABLE WEALTH.

All sources:

1898.....	\$1, 629, 783. 29
1897.....	1, 602, 314. 20

Increase over last year	27, 469. 09
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(For particulars see board of equalization.)

ORGANIZATION.

Pinal County was organized in 1875 from portions of Pima, Maricopa, and Yavapai counties, and contains an area of 5,338 square miles, or 3,435,520 acres, one-third of which could be made productive by the systematic storage of the surplus water now running to waste. Next to Maricopa it is the most important agricultural county of the Territory. It is traversed from east to west by the Southern Pacific Railroad, and a branch of the great Santa Fe system is now approaching from the north. The Southern Pacific is also building in this direction from Tempe, and it is confidently believed that work will not cease until the Deer Creek coal fields are reached and connection is made with another branch of that road running from Bowie to Globe and now completed to Geronimo.

THE COUNTY SEAT.

Florence, the county seat, contains a population of about 1,500, but with the completion of these two roads and the Buttes reservoir no city in Arizona can approach it for natural advantages, and a large increase in population will follow. Florence is at an elevation of 1,553 feet above sea level, situated near the Gila River, 26 miles northwest of the railroad station at Casa Grande, with which it is connected by an elegantly equipped daily stage line. Going and coming stages run by the old Casa Grande ruins, and passengers are allowed a short time to inspect them.

There are many handsome private residences in Florence, several brick stores, good hotel, graded school employing four teachers, churches, secret societies, commercial club, the Florence Tribune (the only newspaper in the county), and the handsomest court-house in the Territory. Here is held the United States court for the district composed of Gila, Graham, and Pinal counties. The streets are lined with shade trees, which impart an air of comfort on the warmest days.

During the past year our people have been blessed with copious rains, plenty of grass, and an abundance of water for irrigation. Under the Casa Grande Valley Canal the amount of land under cultivation has been increased to 7,000 acres. There are 24,400 acres with water rights, mostly patented lands. A large acreage was sown to wheat this year, mostly white Australian, and as the yield was in many cases as high as 20 sacks to the acre, and excellent prices were obtained, our farmers are prosperous.

THE BUTTES RESERVOIR.

As is generally the case throughout the entire arid region, there is a shortage of water during a few days in the summer season, and to secure absolute security it has been found necessary to supplement the flow of water in the rivers by building storage reservoirs. This has been done in this county by the Casa Grande reservoir, which covers a surface of 1,600 acres, with an average depth of 12 feet, and contains about 8,000 million gallons of water.

In order to make the water system more effective, however, it will be necessary to build another reservoir in the Buttes, 12 miles from Florence. Capt. W. A. Glassford, of the United States Army, has made a personal examination of the proposed site, and his report to the special Senate Committee on Irrigation and Reclamation of Arid Lands is well worth a careful perusal. Other eminent engineers, including Mr. Arthur P. Davis, of the United States Geological Survey, have also made favorable reports. The report of Mr. Davis on the Buttes reservoir, which was published as Senate Document No. 27, Fifty-fourth Congress, second session, was most exhaustive.

expressed himself as well pleased with the location, and recommends that the Government build the dam and works in order to supply water in unlimited quantities to the Indians on the Sacaton Reservation. This was the object for which he went out, but incidentally the work will be of great benefit to our county. Mr. Davis's report concludes as follows:

The plan recommended, therefore, is the construction of a storage reservoir at Buttes, and canal and distributaries on the plan indicated previously in this report. For this plan an appropriation of \$2,244,000 should be made immediately available, and authority granted for the condemnation of right of way when necessary."

That Mr. Davis's recommendation will be adopted by Congress in the near future is not answered, as he shows plainly that the Government could readily recoup for the expense of construction by adding value to large tracts of land now worthless and by rendering the Indians self-supporting. Mr. Davis's work includes a survey of Queen Creek reservoir site, of which he says (p. 53):

The Queen project offers as its utmost possibility a supply of water barely sufficient for the present minimum demands of the Indian reservation. If it is intended to take any considerable number of Indians on the reservation other than those mentioned in this report (and there is an abundant field of land for that purpose), the present Indians grow as they should in numbers and ability to cultivate the tracts, then an additional independent water supply would have to be provided by the relatively more expensive way of pumping. The cost of such additional supply would be somewhat less than the estimates for pumping would indicate, but, in years of excessive supply, the waters of Queen Creek would be made to serve the duty and the running expenses of pumping saved. The table shows six such years in the record of twenty-four.

On the other hand, the cost of storage per acre-foot is much less by the use of the Buttes reservoir than by the Queen Creek. It would furnish as much water as might be desired for the Indian reservation and leave a large surplus to be sold to settlers on Government lands under the canal system. It seems certain that it will some day be desirable to furnish the Indian reservation about 20,000 acre-feet of water annually. This is double the estimated capacity of the Queen reservoir. If this amount of excess were furnished by pumping from wells this investigation indicates that the entire cost, capitalizing the running expenses at 4 per cent, would be in the neighborhood of \$1,000,000. Double this sum invested in the Buttes reservoir would furnish a reliable supply of seven or eight times as much water, and the surplus could be used to give value to the large tract of Government land which it would serve, and the Government could thus recoup itself for the expense of construction. Therefore, there is no question but that for the provision of this quantity of water the construction of the Buttes reservoir is by far the cheapest method in the end. Some broad questions of public policy are also involved in this problem, and deserve serious consideration. These two reservoirs are great natural resources, and it is to the public interest that they, together with the public lands which they would water, should be utilized to the greatest possible extent. A broad economy, therefore, dictates the choice of the Buttes project, and the Government being the owner of the land to be watered, is directly interested in having them reclaimed as economically as possible."

POPULATION.

The population of the county by the last census was 4,251, and it is not less than 4,000 at this time.

MINES AND MINING.

The silver mines of Pinal County, being largely low-grade ore, the output of the metal has been next to nothing for the past year, the present price being so low that they can not be worked with a profit. The Silver King is an exception, and work has been recently started up on this property, which has in time past paid \$2,000,000 in dividends to stockholders. In gold mining, however, there has been considerable activity at Mammoth, Goldfield, Mineral Creek, Ripsey, and other places, and the bullion output of gold for the year has been about \$250,000. The principal mines of the county are the Silver King and the Raymert (both silver and copper with 20-stamp mills), the Keyward (copper), and the following gold mines:

	Stamps.		Stamps.
Mammoth	50	Victoria, south of Casa Grande	10
Mammoth, at Goldfield	20	Mammoth, south of Casa Grande	20
Keyward, at Mammoth	50	Southern Belle, at Catalinas	20
Log, at Goldfield	10	Norman, at Ripsey	20
Raymert, at Mineral Creek	5		

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A small amount of placer gold has been taken out of the Catalinas and sold in Tucson. There is an evidence of awakening in all kinds of mining, and the prospects for the coming year are flattering.

CASA GRANDE RESERVOIR.

The reservoir of Casa Grande Valley Canal Company is the largest in the Territory. It is situated 15 miles southwest of Florence. A levee of earth has been thrown up across a depression in the plain 14,000 feet in length, 125 feet in width at the bottom and 25 feet in width at the top, 2 to 1 slope on each side, and an average height of 25 feet. The waste is regulated by three cast-iron pipes 3 feet in diameter, set in solid masonry, regulated by gates and tower. This reservoir cost \$150,000 and supplies water for 6,000 acres.

METEOROLOGICAL.

The Signal Service of the General Government maintained a station at Florence from 1874 to 1882. The report covering a period from July 1880 to April 1882, gives the following statistics, which may be given as a safe guide for the prevailing temperature, which varies but little from the mean temperature given during the series of six years:

Month.	Mean.	Maxi- mum.	Mini- mum.	Month.	Mean.	Maxi- mum.	Mini- mum.
1880.	°	°	°	1881.	°	°	°
July	86.6	111	61	June	83.7	118	44
August	86.5	112	60	July	87.9	112	64
September	81	107	48	August	84.5	110	62
October	68	96	32	September	77.5	103	50
November	52.1	80	25	October	67.4	98	28
December	50.9	77	27	November	52.4	80	26
1881.				December	52.2	81	28
January	45.7	78	21	1882.			
February	54.7	85	21	January	46.4	79	23
March	51.7	93	29	February	49.5	72	27
April	69.1	100	48	March	57.3	92	25
May	74.7	104	45	April	62.1	100	32

The heat, as represented in the above table during the months of June, July, and August, is nothing like as unbearable as in the Eastern States, and death from sunstroke is unknown. In fact, during a residence of sixteen years in Arizona, the writer has only known two people to be overcome by the heat, and they recovered. Their condition, however, was more the result of whisky than heat.

UNTOUCHED BY FROST.

Orange and lemon trees require slight protection during the winter for a year or two, until the wood is sufficiently hardened.

While it is a popular thing for one to say that he is "not here for his health," it is an undisputed fact that for all pulmonary ailments no climate is equal to southern Arizona, and there are numbers of active, industrious citizens with but one lung, who came here years ago expecting to live but a few weeks. But for all that the wonderful Casa Grande Valley is something better than a health resort.

PRODUCTS.

The waters of the Gila River are fresh and pure. The soil contains no alkali; is a deep, rich, gray ash, especially adapted to the growth of prune, olive, almond, peach, fig, pear, apricot, and fruits of all kinds, which pay largely on the investment. It is also the natural home of alfalfa, which grows in the most prolific manner. The grape does exceptionally well in this valley, and wine and raisin culture is destined to become a prominent industry. Citrus fruits have been cultivated to a limited extent. There are a number of orange trees in the neighborhood of Florence, which bear the golden fruit each year without protection, and a few date-palm trees are also in full bearing. The season is from six weeks to two months earlier than southern California, which gives fruit growers an appreciated advantage in the early markets.

The absence of fogs and nightly dews is a formidable obstacle to the existence of

the destructive and unsightly scale bug, and the fruits of the valley are all bright and clean. All the agricultural products of the temperate and semitropic zones are easily grown here, and long seasons give succession of crops that double or treble the productive value of the land.

PRICE OF LAND.

Improved lands with Government title and water right can be bought for from \$30 to \$50 per acre, according to location and improvements. In the immediate neighborhood and to the south of Casa Grande ruins, there are thousands of acres covered with a heavy growth of mesquite timber yet open to settlement. These are among the choicest lands of the valley. Water in inexhaustible quantities is found at a depth of from 20 to 30 feet; in fact a river seems to be flowing underneath. Here is a splendid opportunity to take up and improve land with a pumping system of irrigation, which is said to be successful on small tracts.

However, with the completion of the Buttes reservoir, pumping will be a thing of the past, and it is only mentioned here for the purpose of showing that it can be done, and to magnify the further fact that what was once considered an uninhabitable desert is in truth the most productive land on the globe, and that there is water in abundance to bring every foot of it under cultivation, only waiting for the magic wand of capital to develop it. There is no water-storage system of the Pacific coast that has one-half the advantages and so few engineering difficulties as the Buttes reservoir. Here nature has built the abutments in everliving rocks, and all that is left for man to do is to put in the head gate, the bluffs that form the gorge being only separated by a paltry 220 feet. A country is drained through this canyon 200 miles square, representing 40,000 square miles, or larger than Maine and Massachusetts combined. The rainfall is sufficient to fill this reservoir twice a year, and the land to be brought under cultivation is practically limitless. This may read like a fairy tale, but it is every word true, and has been verified time and again.

YAVAPAI COUNTY.

On account of a vacancy in the office of commissioner of immigration for this county in 1897, I contributed a very hastily prepared and rather incomplete report as a substitute for said officer.

As this will no doubt fall into the hands of many who did not see that report, and as the geographical location and topographical conditions of the county have not changed in the least, I can conceive of no better introduction to this report than by quoting from that of last year pertaining to these features as follows:

"Yavapai County, where the first white settlement in Arizona was made, and where the seat of the Territorial government was first established with any degree of permanency, is mainly a rugged and mountainous country, with a few rich and fertile valleys scattered between its mountain ranges. The lowest elevation in the county is probably 1,200 feet above sea level, while the highest peak, Mount Union, situated about 12 miles south of Prescott, rises to an altitude of 10,000 feet. There are a few undulating and grassy plains or mesas, the most notable being Lonesome Valley, east of Prescott, some 20 miles in length by from 2 to 8 miles wide; a mesa contiguous to Williamson Valley, a large plateau east of Hell Canyon, and quite an extensive area of desert land in the southwestern part of the county.

"The native grasses which grow on these mesas and plains furnish an abundant pasturage for cattle, and in favorable seasons are also susceptible of being mowed for hay.

"Nearly all of the mountain ranges contain precious metals, gold, silver, and copper being found in large quantities, the mining and reduction of such ores forming one of the principal industries of the county.

"Prescott is the central point of this great mining region."

CLIMATE.

Yavapai County, as well as a great portion of northern Arizona, is possessed of a very excellent climate, it having been very aptly said to have "the best all-the-year-round climate to be found anywhere." I can not better express the advantages of this than by quoting a recent writer on the subject as follows:

"The most attractive feature of this part of Arizona is its climate, a climate that all the superlatives in the language can not do justice to. Distinctions of latitude and altitude, isothermal lines—in fact, all the stock in trade of the meteorologist affords no methods by which its excellent qualities may be elucidated. What Italy might be from a climatic standpoint, if freed from its miasmatic poisons, northern Arizona is. On no other portion of the globe, unless it be the high plateau of the Himalayas or Andes, can such a flawless climate be found. The altitude is just

sufficient to give the air a bracing quality without subjecting it to a rarification that necessitates any overtaking of the lungs. The wonderful clearness of the atmosphere is a subject of constant comment from all unacquainted with its peculiarities. Its clearness in the matter of vision is most deceptive. Objects 30 and 40 miles distant are seen with a clearness of outline and perspective that a good field glass could not develop at a distance of less than 10 miles on either the Pacific or Atlantic coasts.

"While other portions of the Territory are subjected to extreme heat and cold, the climate of this section in this respect is most equable—its average annual mean temperature, as shown by the records of the United States Signal Service offices at Whipple Barracks, Date Creek, Wickenburg, and Fort Verde for a period of ten years, being but a fraction under 58° F., the climate in this respect being identical with that of southern California.

"But while the mean annual temperature of southern California and Arizona are so similar, there are other factors which combine to make the climates of the two sections almost diametrically opposite. The atmosphere of southern California, heavily charged with moisture, is, during times of high temperature, close and oppressive, causing respiration to be laborious, while the entire system seems to be suffering from exhaustion and lassitude after the slightest mental or physical exertion. In the months of lower temperature the superabundant moisture is still more disagreeably felt in the form of fogs, during the prevalence of which an universal influenza seems to rule so supremely as to exclude from consideration all the other 'ills that flesh is heir to.' In northern Arizona how different are the climatological conditions presented in this respect. A dry, rarefied atmosphere, filled with oxygen and ozone, prevails throughout the year, and endows one with renewed vitality at each inhalation. The waste and refuse tissue is, through its agency, eliminated from the system with a rapidity unknown where the air is more humid, the result being greater mental and physical vigor and increased ability to sustain longer protracted continuity of thought or more manual efforts."

QUARTZ MINING.

While the past year has seen no new mining enterprises of any magnitude inaugurated in this county, the mining interests continue prosperous. All of the properties mentioned in this report for last year have added to their machinery as well as to their development work. The shaft of the Congress mine has been extended to a depth of 1,850 feet, or 150 feet deeper than it was one year ago, with the most gratifying results. A large amount of new machinery has been added to the United Verde mines at Jerome, and the output of the property has been proportionately increased.

A new mine which has come into considerable prominence during the year is the Crown Point, near the Hassayampa, just below the site of the Walnut Grove Water Storage Company's dam. It has been opened up to a depth of nearly 300 feet, showing a ledge of an average of about 4 feet in width, and fine ore bodies of high-grade gold ore. Arrangements were just about consummated for erecting machinery on the property for the reduction of ore when the war with Spain was declared, and the superintendent, who is one of its owners as well, Alex. O. Brodie, accepted a commission as major in the First United States Volunteer Cavalry Regiment, known as "The Rough Riders," when operations in the mine were suspended, and it has remained inactive ever since.

There are now in the county 34 stamp mills, for the reduction of gold ores, with over 400 stamps, and several plants are now in course of construction.

Among the most prominent mining properties in the county are the following, five in number: The United Verde Copper Company's group, located at Jerome, 28 miles northeasterly from Prescott. This is not only the largest property in Arizona, but ranks among the largest in the world. While the ore is copper, it contains a large per cent of both gold and silver, and the value of either of the three metals in the ore, it is said, is sufficient to pay a handsome profit for mining, were the others excluded. Exact statistics in regard to its output are not obtainable, but a close approximation places it at between 30,000,000 and 40,000,000 pounds of copper per year, the value of the daily product being from \$20,000 to \$25,000, or from \$7,000,000 to \$9,000,000 per annum. While the company has on its pay roll between 700 and 800 men employed in various capacities, the number actually employed in mining does not exceed 25 men. This number of men remove from its place where nature has stored it the ore from which the above values are extracted. Additions are constantly being made to the plant for the reduction of the ore.

The Congress is a notable gold mine, located 52 miles southwest of Prescott. It is developed to a depth of 1,850 feet, has a 40-stamp mill in operation, besides a large roasting and cyanide plant, the latter being used exclusively in the treatment of the tailings from the mill, and the product of the mill is shipped in the form of concentrates.

miles south of Prescott, in the Bradshaw Mountains, is the Crowned King gold property developed to a depth of 500 feet, which, with a 10-stamp mill, round numbers \$25,000 per month to the circulating medium of the country, and \$10,000 is apportioned to the stockholders in dividends.

Five miles easterly from Prescott is the McCabe mine, developed to a depth of 500 feet with a 10-stamp mill, producing away up in the thousands, just how much is known only to the three owners.

Five miles from the McCabe is the Little Jessie, also developed to the same depth of 500 feet, which has produced about \$500,000 and is still in operation.

All the above properties have furnished their own capital for their development and a dollar has been put in them toward the development work except what has been taken from them. These properties are specially mentioned as showing the possibilities of the county. Numerous others could be cited which are doing the same thing in a smaller way, being yet in their infancy and not having attained the results of development work as those named, but with equal possibilities of success. There are scores of others too which only need the magic touch of capital to yield handsome dividends to the investor, and still other numerous promising prospects, in which the game of chance, which enters more or less in all the business affairs of the world, exists, but favorable to gain rather than to lose.

One of the very desirable features connected with mining in this county is the relative abundance of wood and water to be found contiguous to nearly every mining district, together with the mildness of the climate, which makes it possible to engage in this industry the entire year, and no loss is entailed by inclement weather during the winter months.

Another important fact connected with mining is that every prominent property in the county is in active operation has been opened up without the aid of outside capital and is paid for its own development. From the very first discovery of gold in the county, in 1863, it has been a constant and steady producer of this precious metal, and during the latter years it has attained very prominent rank as a copper producer.

PLACER MINING.

Several hundred men are constantly engaged in placer mining in numerous gulches along many of the larger streams in the county. To estimate even approximately the amount of gold taken out by them is impossible without considerable investigation, as they trade it off to merchants for supplies, sell it to banks, ship by express, and dispose of it in various ways. It is not an unusual circumstance for a retail merchant of Prescott to buy \$2,000 per month, and from the placer mines up to \$5,000. These placer miners secure the gold from the gravel by washing with a rocker and by dry-washing process in dry seasons. The best evidence that wages are made by those engaged in this work is the fact that they continue to work after year in the business, preferring it to working for wages.

The section where the greatest number of men are engaged in placer mining is the Rich Hill mining district, at the southeasterly base of Rich Hill, 50 miles from Prescott, there being from 30 to 40, mostly Mexicans, constantly at work there within a radius of 2 miles, and the aggregate amount taken out by them is estimated at \$2,000 to \$4,000 per month, depending largely on the water supply for sluicing and washing.

It was on the summit of Rich Hill, in 1864, that over \$500,000 in coarse gold and nuggets were taken from an area covering about an acre of ground. Nuggets are occasionally found yet on the sides of this mountain varying in value from \$2 up to \$100. An estimate of the value of placer gold taken from that section may be formed from the fact that it is stated that placer mining has been going on there for over thirty years without any perceptible diminution of quantities.

That is true of the above section is also true of placer mining on Lynx Creek, where the first party of white men to reach this section in 1863 engaged in this occupation. While men have been engaged there ever since in this occupation they are increasing in number.

The last above-named stream, 8 miles from Prescott, is an area of placer ground covering several hundred acres, which is owned by an English syndicate, and on which an extensive hydraulic plant has been placed, consisting of ditches, flumes, a reservoir, and two hydraulic giants. Owing to the scarcity of water they are unable to use these giants, except for a very brief period each spring, when the melting snows in the mountains furnish a supply of water, and the results obtained during these periods are remarkably satisfactory.

During the present year the Sterling Placer Company, a corporation composed of foreign capitalists, has acquired title to large placer fields in Walnut Grove district and have placed 200 tons of machinery on the ground, consisting of a steam engine for handling the gravel and appliances for saving the gold in it. This

machinery is being put in place and its operation is anxiously awaited, as the problem of extracting the gold from the immense areas of placer grounds which are found in the county has not yet been satisfactorily solved owing to the scarcity of water.

A machine which will successfully separate the gold from the gravel, at a profit, with the use of only a comparatively small amount of water, should prove a fortune to its inventor, as there are thousands of acres of placer ground in Arizona which are rich in gold and only lack the facilities for separating it from the gravel.

TRANSPORTATION.

The county enjoys excellent transportation facilities, as such are considered in a sparsely settled section of the western country. The Santa Fe, Prescott and Phoenix Railroad extends from Ash Fork, within a mile of the northern boundary line of the county to the southern line of the county near Wickenburg, a distance of about 140 miles, thence to Phoenix, in Maricopa County, its total length being 196 miles. The general offices and shops of the company are located at Prescott.

During the past year a branch of the road called the Prescott and Eastern has been under construction from Prescott to Mayer, a distance of 28 miles. The grading of this line is nearing completion, and 15 miles of the track have been laid. The road will be completed and in operation by October 1 of the present year. This road penetrates one of the richest mining sections of the county, and its terminus is right at the celebrated Big Bug onyx mines. The Big Bug, Chaparral, and Agua Fria mining districts are directly contiguous to the road, while just south of its terminus is the Bumble Bee and Black Canyon districts, and to the southeast the Squaw Peak. Its construction also makes a saving of 28 miles in wagon freighting from all the mines of the Bradshaw country.

The United Verde and Pacific, a narrow-gauge railroad, 28 miles in length, extends from Jerome Junction, 18 miles north of Prescott, to Jerome. This road was built by W. A. Clark, principal owner of the United Verde mines, for the transportation of supplies for the above mines and mining camp and for the product of the same. The traffic furnished by the mine alone is sufficient to pay a good interest on the investment, although the road for about one-half of its length is constructed over a precipitous mountain country.

The Congress Gold Company also has a line extending from Congress Junction, on the Santa Fe, Prescott and Phoenix Railroad, a distance of 3 miles, to its mining camp at Congress. Like the last-named road above, this one was built exclusively for the traffic furnished by the company's mine and is operated with special reference for its accommodation.

Stage lines run from Prescott, or from some other railway point, to every part of the country not reached by railroad connection, thus giving good mail facilities as well as making every inhabited section of the county easy of access.

AGRICULTURE.

The principal agricultural valley of the county is the Verde, so called from the name of the river flowing through it. There are several small irrigating ditches, built and owned mostly by the owners of the land irrigated by them. Wheat, corn, oats, and barley produce bountifully and alfalfa grows luxuriantly, from four to five crops of the latter being harvested each year. There are two small mills in the valley which produce an excellent quality of corn meal; but the farmers, as well as all residents, import all the flour consumed, and it seems as though a flouring mill located at a convenient part of the valley would be a paying investment to the party who would build it, besides being of great benefit to farmers by stimulating wheat growing.

The town of Jerome, containing a population of about 2,000, is located within 2 miles of the northerly end of the valley, and would afford a market for a considerable portion of the product of the enterprise, while Cherry Creek, Agua Fria, Big Bug, and Chaparral mining districts are scarcely less remote from the valley than from Prescott, the base of all their supplies, including flour. The railroad to Jerome would also furnish an outlet to any surplus which could not be marketed at more convenient points.

Other smaller valleys are Agua Fria, Big and Little Chino, Williamson, Skull, Thompson, Kirkland, Santa Maria, Walnut Creek, Walnut Grove, Peebles, and Miller, each of which contains a limited population engaged in agricultural pursuits. The possibilities of some of these, notably Big Chino and Williamson valleys, are of considerable magnitude if water-storage systems were inaugurated. Much of the land embraced in the mesas and plateaus of the county could also be made highly productive by irrigation, which can only be accomplished through a system of water-storage reservoirs.

RESERVOIRS.

No progress whatever has been made during the past year toward the construction of water-storage reservoirs, though it is conceded that no considerable progress can be made in the matter of opening up new fields of agriculture except in this way. Several reservoir sites have been located which would afford an abundance of water for irrigating fertile lands, but the capital to push the reservoirs through to completion has been lacking. Hence the water that would convert a desert into a paradise of beauty and wealth is permitted to go to waste, and land upon which thousands of settlers could make good, comfortable homes remains uncultivated and unproductive.

Even the rebuilding of the Walnut Grove water-storage dam seems as remotely in the future as it did one year ago, although the company still maintains its title to its location by doing the annual assessment work, costing several thousand dollars. The purpose of the company is to build a dam for the storage of water to be used for hydraulic mining and irrigation, with the additional possible and probable use of generating electricity for motive power for mining enterprises.

Another site for a water-storage dam has been located and preliminary surveys for canals have been made on Date Creek, within 10 miles of the Congress mine. Thousands of acres of as fertile lands as can be found anywhere can be brought under cultivation by irrigation from water from this dam, and the enterprise only lacks capital to carry it to a successful culmination.

Another prominent site for a water-storage reservoir, and one which has attracted considerable attention of late, is in Big Chino valley, which could be utilized in the irrigation of a very large section of fertile lands.

LIVE STOCK.

Next in importance to mining is the live-stock industry of the county. While overcrowding of the ranges and the low prices which obtained for a number of years were disastrous to this industry, the past year, as well as the one preceding it, have been very prosperous years. Stockmen have obtained good prices for the products of their ranges, while a copious rainfall has produced good grazing, and shipments during this year have been quite heavy, at the same time leaving the ranges still well stocked, as will be seen by reference to the abstract of taxable property.

GAME.

Game abounds in many localities, such as bear, deer, turkey, quail, etc. Good trout fishing can be found in many of the mountain streams.

CITIES.

Prescott, the county seat, containing a population of about 3,000, is beautifully located in the valley of Granite Creek, at an altitude of 5,000 feet, and is surrounded on all sides, except a narrow pass to the north, by a succession of mountains rising to altitudes of from 7,000 to 10,000 feet. It is the base of supplies for most of the mining camps surrounding it. Good paying mines are located within 4 miles of the town. Unlike many of the Southwestern towns, the population is almost exclusively American. The streets are lighted with electricity, while this illuminant is also extensively used in business houses and private residences.

The town contains two public-school buildings, in which are employed nine teachers, one of whom is engaged in kindergarten work, supported by the public funds.

There are 5 churches, as follows: The Methodist Episcopal, Methodist Episcopal South, Congregational, Baptist, Episcopal, and Catholic. Two daily papers, one Republican and one Democratic, are published in the town. An ice factory, steam laundry, 3 bottling works, 2 planing mills, 2 telephone exchanges, 2 banks, and 6 hotels are also contained in the town, and parties are now contemplating the erection of a brewery.

The Santa Fe, Prescott and Phoenix Railroad, extending from Ash Fork, on the Santa Fe system, 60 miles north, to Phoenix, the capital of the Territory, 140 miles south, runs through the town.

TOWNS.

The other principal towns in the county are Jerome, Congress, Ash Fork, and Seligman. The latter two are located on the Santa Fe Pacific Railroad, Ash Fork being the connecting point of the road with the Santa Fe, Prescott and Phoenix, and Seligman was formerly the northern terminus of the Prescott and Arizona Central Railroad during its existence, but when the road ceased operation in 1893, became almost deserted. During the past year it has again grown into considerable

importance through the building there of a large water-storage reservoir by the Santa Fe Pacific Company and by the establishing there of division headquarters of the road. The construction of the Prescott and Eastern Railroad has already resulted in the starting of the town called Mayer, at its terminus in Big Bug district, which is destined to become one of considerable importance, as the building of this road makes a large area of territory as well as many important mining camps tributary to it. A daily stage line is already in operation over this route via Black Canyon to Phoenix, the terminus of which will be changed from Prescott to Mayer upon the completion of the road and the commencement of its operation. A stage line from Crowned King will also connect with this railroad at its terminus.

HORTICULTURE.

Apples, pears, peaches, grapes, and berries of both extraordinary size and superior quality of flavor are grown in many places in the county, with great profit to those engaged in their culture, as the supply does not yet meet the demand. New orchards are, however, being planted each year, and within a few years the supply will not only be adequate for the home market but they will become a prominent article of export, and particularly as to apples. The possibilities of apple culture, with an assurance of a good market, are quite extensive, as there are few places in the Territory where this fruit can be successfully grown. Apples grown in an orchard near Jerome took the premium at both the World's Fair in Chicago and the Mid-Winter Fair in San Francisco. Two orchards near Prescott have also furnished prize-winning fruit at the New Mexico Territorial Fair. A new orchard in the western part of the county, consisting now of over 4,000 trees, varying in the age of transplanting from one to four years, gives promise of furnishing fruit for export. The possibilities of this place for fruit growing was demonstrated by a few trees which are now eight or nine years old, samples of the fruit from which were sent to prominent dealers in Eastern cities and pronounced by them superior to the choicest fruit found in Eastern markets. The older trees of the new orchard are just commencing to bear fruit this year, and it comes up fully to the expectation of its owners, who expect to be able to add to Arizona's reputation as a fruit-producing country. A very large majority of the trees of this orchard are apples, the soil and climate seeming to be specially adapted to the cultivation of this fruit to perfection.

HEALTH RESORT.

Fifty miles south of Prescott, in an ideal location for a health or pleasure resort, are located the Castle Creek hot springs, the waters from which possess great curative properties for skin and blood diseases, kidney and liver complaints, indigestion, etc. The water is used both internally and for bathing purposes. A stage line connects with the Santa Fe, Prescott and Phoenix Railroad at Hot Springs Junction, making them easily accessible, the distance from the railroad being only 25 miles and over a good mountain road.

TAXABLE PROPERTY.

There has been a slight increase in the county's taxable property during the year. The following abstract of the taxable wealth of the county is taken from the records of the board of supervisors:

REAL ESTATE.

Land (395,412.91 acres).....	\$234, 535. 21
Patented mines (acreage unknown).....	305, 751. 00
Improvements on lands.....	104, 750. 00
City and town lots.....	372, 550. 50
Improvements on city and town lots.....	566, 393. 00
Total.....	\$1, 583, 979. 71

RAILROADS.

Santa Fe Pacific (60.552 miles, at \$5,000 per mile).....	302, 760. 00
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LIVE STOCK.

Horses (6,384).....	\$108, 381. 00
Stallions (19).....	1, 115. 00
Mules (82).....	2, 015. 00
Asses (220).....	2, 104. 00
Total (6,705).....	113, 615. 00

Cattle (56,140).....	\$505, 260. 00	
Bulls (13).....	260. 00	
Dairy cows (508).....	9, 695. 00	
Total (56,661).....		\$515, 215. 00
Sheep (25,367).....	38, 550. 00	
Goats (3,117).....	3, 903. 00	
Swine (743).....	1, 712. 00	
Total (29,227).....		44, 165. 00
All other property.....		1, 348, 912. 16
Total of all property.....		3, 908, 646. 87
Total assessment, 1891.....		3, 854, 829. 76
Increase		53, 817. 11

EDUCATION.

Good educational facilities exist throughout the county in all communities containing a sufficient number of pupils to maintain a school, the legal number being 8. The following statistics, taken from the report of the county school superintendent, will be found interesting:

School districts in the county	40
Schools in the districts.....	52
Grammar schools.....	17
Primary schools.....	35
Total enrollment of pupils in public schools.....	1, 564
Average number of pupils belonging	1, 001
Average daily attendance.....	920
Percentage of attendance on average number belonging.....	91
Male teachers.....	9
Female teachers.....	42
Pupils in advanced grades.....	78
Pupils in grammar grades.....	588
Pupils in primary grades.....	898
Highest salary paid per month	\$125. 00
Lowest salary paid per month.....	\$61. 00
Average monthly salary paid.....	\$67. 60
Average length of term (months).....	6. 9
Total amount paid teachers.....	\$24, 717. 28
Total amount paid, contingent expenses	3, 775. 01
Total amount paid, school libraries	17. 25
Total amount paid, school apparatus	373. 96
Total amount paid, school furniture	352. 85
Total expenditures.....	29, 236. 35
Value of schoolhouses and furniture.....	43, 440. 00
Value of school libraries.....	660. 00
Value of school apparatus.....	4, 390. 00
Total value of school property	48, 490. 00

Inducements for the investment of capital in Yavapai County are numerous, as opportunities of various kinds are found here, needing only the touch of the magic wand of wealth to make them spring into successful remunerative business enterprises.

YUMA COUNTY.

PHYSICAL AND TOPOGRAPHICAL FEATURES.

Yuma County, one of the four original political subdivisions of the Territory when it was first established by the act of Congress on February 24, 1863, as an independent Commonwealth, forms the extreme southwestern portion of Arizona. It lies between 32° and 34° 21' north latitude and 113° 20' and 114° 14' west longitude. It is bounded by Pima, Maricopa, and Yavapai counties on the east, the Colorado River on the west, Mohave County on the north, and Sonora, Mexico, on the south. It has an area of

10,138 square miles (6,488,320 acres), an expanse greater than either of the seven smaller States of the Union, and larger than Connecticut, Rhode Island, and Delaware combined.

For more than 100 miles it is crossed from east to west by the Gila River, which thoroughly drains the southern and eastern portions, eventually emptying into the Colorado at the town of Yuma; while the Colorado washes its western boundary, effectually draining the remainder.

The topographical configuration of the surface includes a series of wide plateaus, rising gradually from a point situated at the southwestern extremity, with an altitude of 60 or 80 feet above sea level, to an elevation in the north and northeast very much greater, the whole sloping gently in a southwesterly direction. These plateaus are crossed by numerous mountain ranges, especially in the northern part, the ranges being separated by broad valleys, many consisting of excellent lands. The various mountain systems, though rough and abrupt in character, are highly mineralized, carrying gold, silver, copper, lead, iron, and other metals in paying quantities. The eastern and southern divisions include gradually sloping plains, covered in places with natural grasses and trees, among the latter being the mesquite, ironwood, and palo verde. Here and there are detached hills and spurs of eruptive origin.

All that country embraced within the county confines situated north of the natural watershed of the Gila, owing to the slight rainfall and few streams from which water can be taken for agricultural purposes, is practically worthless, so far, at least, as the feasibility of bringing large bodies of irrigable land under cultivation is concerned. The available arable region therefore is limited to broad strips of country lying directly north of the Gila and east of the Colorado rivers, and also hundreds of miles of splendid lands stretching directly southward from the Gila River to the Mexican frontier. Consequently, it is upon these rivers that water-storage reservoirs must be established.

It is more than probable that less is known of the physical and topographical peculiarities of Yuma County than of any other county in the Territory. According to the map of the Interior Department, issued from the General Land Office in 1883, it is shown that less than 10 per cent of the total area was surveyed by the Federal authorities. It is believed that no further surveys have been ordered since the date mentioned; and, therefore, so far as official recognition extends, more than nine-tenths of the county is a veritable terra incognita.

The population numbers 3,000 souls, and the valuation of taxable property reaches, in round numbers, \$1,500,000.

THE VILLAGE OF YUMA.

Although the town of Yuma is the second oldest community in the Territory of Arizona, it is astonishing how little its resources are known to the world at large, and how slightly developed is the natural wealth of the county. This is owing partly to Yuma's reputation for unbearable heat and partly to the fact that lying next to California, it has been assumed that the county has been thoroughly prospected for mineral wealth; and prospectors have, in the main, kept the traveled highways in crossing its territory. As a matter of fact, one suffers less from the heat here than in almost all of the settled communities of the East, owing to the dryness of the atmosphere, and there is no healthier climate on God's footstool.

People labor out of doors from the rising to the setting of the sun and suffer no inconvenience. There has never been known, in this section of country, an authentic case of sunstroke. Our climate, taken in time, never fails to cure pulmonary complaints of any description; and epidemic diseases, such as smallpox, cholera, etc., rarely visit us, and then only in a very mild form, and are never fatal except through the perversity of patients. Contrary to the belief of the uninformed, the dry heat of the summer months is especially conducive to good health and exceptional vigor, acting naturally upon the human system with the same effect as the artificial result of a Turkish bath—purifying and renovating it. As a further matter of fact, this county has never been even superficially prospected, and it is only now that people are beginning to search its hills, with any degree of systematic enthusiasm, for the mineral wealth hidden there. Owing to the falling off in the price of silver, deposits of gold only are being sought for, and the present result is little short of marvelous. In all sections of the county, from the Sonora line to Williams Fork, discoveries are daily being made, and the greater the development the greater the wealth displayed. Wherever the prospector plants his foot, ledges of gold confront him or are brought to light by the investigating strokes of his pick.

Portions of country traversed for years by commonly traveled trails are developing into rich storehouses of golden wealth. New and rich placers are constantly being discovered, and shipments of placer gold from this point through Wells, Fargo & Co.'s express are steadily increasing in value. From a mining standpoint Yuma

County is rapidly leading the Territory, and yet, as far as that industry is concerned, this section has hardly got into its stride.

Agriculturally, the county is vastly improving. Enterprises that have lain dormant for the last two years, owing to the general financial depression and consequent dearth of money for investment purposes, are waking up to new life and vigor. Money is being attracted in this direction, and on all sides can be distinguished that indefinable stir which is the precursor of an industrial awakening. Even within these last two years of financial stringency and depression, there has been a steady, if slow, increase in agricultural development and wealth. A greater area of old farms has been put under cultivation, and new lands have been inclosed and new fields started. A large section on Blaisdell Heights has been planted to fruit trees; fields of cereals and alfalfa have been added to the cultivated area on the Colorado River below town; the lands lying under the Mohawk and Farmers' canals have been made to yield heavy crops of every variety of agricultural products, as in other sections of the Gila Valley, and the gardens of Yuma have been added to and beautified in fruits, flowers, and shrubbery to a more than appreciable extent. Altogether we may feel proud of our progress during these last months of business depression and discouragement. It speaks well for the industry and pluck of our people, and the showing made constitutes the best evidence of the merits of our soil and climate and the richness of our mineral resources. Nature has done everything for our county, and all that is needed is a touch of the wand of capital to have our hills and valleys spring into an active life of remunerative industry that will last and endure forever.

Some three years ago, through the energy of H. W. Blaisdell, the Yuma Water and Light Company was incorporated, and by means of its large pumping plant, at the foot of Main street, the town is abundantly supplied with water at reasonable rates, and there have grown into existence new and large gardens and orchards.

CLIMATE.

It is rather without the intent of this report to dwell in detail upon the sanitary advantages offered by our almost perfect climate, and yet a few words upon this subject may not be inappropriate.

For nine out of every twelve months the climate is simply superb. Three months are warm, but not excessively so, although the thermometer ranges far higher than would be conducive to health or comfort in any section of the East. The conditions, however, are most dissimilar, as may be seen by the following, taken from the official communication of Lieut. W. A. Glassford, of the United States Signal Corps, to the governor of the Territory:

"A few words upon the heat. It is recorded as extreme, yet no one suffers, and sunstrokes are unknown. This is usually accounted for from the purity and dryness of the air. Both are true; but the dryness is, perhaps, the correct reason. I have calculated the difference between the shade and sensible temperature at Yuma during the heated hour of the day, and it is about 30 degrees. At New York or Washington it is only a few degrees, and often identical. The highest shade temperature ever recorded at Yuma is 118 degrees. When the heat is at this point, the sensible temperature is about 88 degrees. The shade temperature of New York being 105 degrees, the sensible temperature is certainly near 100 degrees. The difference between the mean temperature and the mean sensible temperature for July is over 17 degrees at Yuma.

"These considerations of the sensible and shade temperature will account for the absence of any detrimental effect upon the extreme heat of Arizona.

"The air is dry. The moisture in the atmosphere is from 25 to 35 per cent, as against 75 to 85 per cent in other localities. Every afternoon in summer there is a refreshing breeze from the Gulf of California that relieves the day of undesirable heat. It passes over a desert, much of which is below sea level, that acts as a desiccant, so that when the plains of central Arizona are reached the air is dry to the last possible degree.

"There are neither sunstrokes in summer nor pneumonia in winter; neither fever nor malaria live or generate in this section. The air is pure—absolutely free from those compounds that poison the system and bring on disease. In no country is there a greater number of bright nights and sunny days. Hundreds afflicted with lung trouble, after visiting Florida and southern California, have found relief in this invigorating climate, where the pure air is a tonic to shattered constitutions, a healing balsam to the consumptive."

The meteorological conditions are indeed admirable for the cure of all rheumatic, bronchial, and pulmonary troubles, as has been proven time and again. In summer the rapid evaporation lowers the temperature and promotes comfort, while in winter the mild, equable, and pleasant weather is delightful and health giving to the invalid.

Herewith is given a table of average temperature, compiled from the official reports, extending over ten years:

January.....	53.6	July.....	92.0
February.....	58.8	August.....	90.9
March.....	65.0	September.....	83.9
April.....	69.4	October.....	72.4
May.....	77.2	November.....	61.2
June.....	85.2	December.....	55.9

The following is the annual meteorological report rendered by A. Ashenberger, observer, Weather Bureau, Yuma, Ariz.:

Year.	Mean actual barom- eter.	Temperature.								Relative humidity.	Number of days.				Wind.	
		Mean.			Highest.	Lowest.	Mean.				Rainy. <i>a</i>	Clear.	Partly clear.	Cloudy.	Average hourly.	Maximum hourly.
		Monthly.	Maximum.	Minimum.			Daily range.	Daily change.	Number of days minimum below 32°.							
<i>Pr. ct.</i>										<i>In.</i>						
1876	29.76	74	.....	.....	114	30	.....	.....	1	.....	1.13	7	287	66	13	.....
1877	29.73	74	.....	.....	114	33	.....	.....	0	35	3.66	15	284	70	11	..... 23
1878	29.73	76	.....	.....	118	29	.....	.....	1	35	2.88	13	294	55	16	..... 45
1879	29.76	74	88	59	116	27	27	2	4	38	3.29	11	308	43	14	..... 36
1880	29.77	71	85	57	111	25	28	2	4	38	.74	2	298	62	6	..... 40
1881	29.76	73	87	59	113	31	28	2	1	44	.98	8	288	69	8	..... 42
1882	29.78	71	85	58	114	27	27	2	3	41	1.78	14	243	106	16	..... 38
1883	29.74	74	88	60	117	22	28	.....	.....	48	.....	.....	.....	.....	..... 44	
1884	29.74	72	84	59	113	34	25	.....	0	50	5.86	30	242	93	30	..... 33
1885	29.76	73	87	60	114	36	27	.....	0	58	2.72	12	232	109	21	..... 48
1886	29.78	72	86	59	112	30	27	.....	4	50	5.35	18	273	71	21	..... 44
1887	29.77	72	87	58	116	27	29	.....	3	54	3.90	9	303	55	7	..... 41
1888	29.74	73	87	58	114	27	29	.....	4	49	2.95	18	282	61	22	..... 46
1889	29.75	73	87	59	117	34	28	.....	0	47	4.69	22	280	49	36	..... 46
1890	29.77	73	86	59	115	30	27	.....	5	42	4.67	22	242	97	26	..... 46
1891	29.77	71	86	57	116	25	29	.....	6	39	2.67	11	303	45	17	..... 48
1892	29.76	72	87	58	116	28	29	.....	6	40	3.35	16	302	58	6	..... 43
Means.	29.76	73	86	59	.....	.....	28	2	.....	44	3.17	14	279	69	17	.....

a Rainy days are those in which the amount of rainfall is 0.01 inch or more.

Concerning the effect in regard to early fruit, the late commissioner of immigration, Hon. Cameron H. King, has this to say:

"The average spring, summer, and autumn temperatures of Yuma are nearly 9 degrees more than at Riverside. This is sufficient to explain the fact that the citrus and other fruits of Yuma ripen from a month to six weeks earlier than at Riverside or other points in southern California.

"Yuma has an earlier and warmer spring. The trees have an earlier start, and the higher temperature matures the fruit sooner. It is evident, since oranges in Yuma ripen in the first of December instead of about the middle of January, as in southern California, that the fruit in Arizona can never be injured by any low temperature in the winter season. And since the labor of the tree is for the season practically over at Yuma before the winter season begins, it is better prepared to stand a lower temperature in winter than it could in California, even were the atmosphere as dry in the latter State as in Arizona.

"It is known that Riverside raises better oranges than Los Angeles; and the reason is that Riverside escapes the fogs which hang over Los Angeles.

"It is proper to observe that the maximums and minimums of temperature, as shown by the Signal Service records, indicate little of practical utility, since such extremes may not last more than a second, and may be the effect of one small wave or ripple of air.

"The warm sunshine of the spring, summer, and autumn days causes the fruit in Yuma to mature early, and gives a delicious sweetness, flavor, and color to the orange, lime, lemon, and other citrus fruits, which they can not attain on the coast of the Pacific, where fogs dampen the fruit, mildew is produced, and dust coats both fruit and leaf.

"It is undeniable that nowhere upon the globe can a spot be found more favorable for the growth of citrus fruits than Yuma County."

the statements of the commissioner can be thoroughly substantiated, as may be seen by the annexed table, showing the time of maturity for certain products: strawberries, January 15; apricots, April 1 to 21; mulberries, April 14 to 20; figs, April 10; grapes, June 1 to 7; watermelons, etc., May 20; peaches, June 15; pomegranates, August 1; limes, September 5 to 10; lemons, September 15 to 25; dates, September 1; oranges, November 25 to December 1.

WATER SUPPLY.

The original source of water supply is comprised in the fall of rain and snow in Arizona and the States and Territories north and northeast of it. Where the fall is later than the evaporation the water eventually finds its way to rivers and streams to drain the mountain regions by seepage, percolation, and surface flow. It may be taken from springs and wells fed similarly.

Water occurs in any portion of the Gila and Colorado valleys at a depth of from 10 to 25 feet, but of course the quantity thus obtained is insufficient for extensive irrigation.

But, withal, the supply upon which the settlers are forced to place reliance is the inexhaustible volume that during high water passes along the channels of the Gila and Colorado rivers to the sea. The drainage of much of Nevada, Utah, Colorado, and all of Arizona finds lodgment in the Colorado throughout its 1,200 miles of channel. An admirable feature in this connection is the peculiarity of reaching its greatest dimensions in the months of June and July, the very time when other seasons are low. But it must be said that there is sufficient at all times to irrigate every acre of land tributary to it. The river supply at the season of irrigation is greater than that of all the utilized streams of California combined.

The Gila at certain annual periods spreads to close upon 2 miles, where the surface is so low so permits, with an average depth of 4 feet. In June, July, and August, for miles from its mouth, it is either very low or absolutely dry, although considerable running water can always be found along the bed rock. It happens frequently that where reefs of rock cross the river the water comes to the surface, only to disappear again when the barrier is passed. An excellent site for storing enormous bodies of water has been surveyed by a competent engineer, the location being in the Gila Valley, a few miles east of the county line, in Maricopa County. The hoarding capacity is in every way equal to furnishing irrigation facilities for the entire Lower Gila Valley, as well as the outlying mesas and higher plains, while the construction will not be attended with unusual difficulties; nor would the cost prove excessive in comparison with the increased value of the lands, large portions of which are now worthless. Such works would effectually obviate the disheartening effects of the sinking of water to bed rock in summer, for the amount saved during high water, that would otherwise have gone to waste, would furnish the means of livelihood to a large population, as against the present meager number.

The Colorado and Gila are included among the most prominent streams of the Pacific coast, and afford more than sufficient irrigation capacity for the cultivation of the rich areas included within the county lines. The former drains a catchment area of more than 242,000 square miles of mountainous country, while the latter so drains an immense surface, very similar topographically. Thus it can easily be seen that water is superabundant. Whether the Government, with an overflowing treasury and command over the most advanced engineering skill of the times, will utilize to the best advantage what is placed before it or not, is a question that can be answered only by itself.

TRANSPORTATION.

An important factor in connection with the early ripening of horticultural, viticultural, and agricultural products is the question of easy and rapid conveyance to prominent market centers east and west. The Southern Pacific Railroad, one of the largest transcontinental lines in America, passing through the city of Yuma, runs through the Gila Valley as far as Adonde, a station some 30 miles east of Yuma. It then passes upon the mesas south of the Gila, the track extending, upon an average, not more than 5 miles from the river until the county line is reached. Thus is afforded convenient egress from any section of the valley and direct communication from thence to all parts of the United States.

Other roads have been surveyed along both sides of the river. Construction is already commenced on the direct broad-gauge route from San Diego to Yuma, and, until it is expected, be continued from the latter town to Deming, N. Mex., but nothing decided or definite can be advanced as to the time of completion.

The Colorado River, being navigable, affords easy transportation by the largest river steamers northward from Yuma to The Needles, where connection is made with the Atchison, Topeka and Santa Fe, thence on to the Grand Canyon of the Colorado, and southward from Yuma to the Gulf of California.

CANALS OF YUMA COUNTY.

Of the several large irrigation canals operating in Yuma County only a few are completed. The remainder, while only partially finished, are nevertheless in a position to meet the requirements of many acres of bottom and valley lands, with the promise of extending their range of usefulness to many times as much again. Almost all head at some point or other upon the Gila River, and are mostly confined within the environs of the valley bearing the same name. Canal building is of comparatively recent origin in the county. A few years since the fertile valleys were almost literally destitute of human inhabitants, while to-day it is safe to say that every acre of valley land along the line of the canals has been filed upon, not to mention considerable mesa land taken up along the line of their projected extensions.

The names of the most prominent waterways, together with the length, carrying capacity, estimated cost, and number of acres tributary to each, are given herewith:

Name of canal.	Length.	Capacity.	Estimated cost.	Acres reclaimable.
	<i>Miles.</i>	<i>Inches.</i>		
Mohawk.....	35	11,000	\$150,000	40,000
Redondo.....	5	600	8,000	1,500
Farmers'.....	18	5,000	15,000	10,900
South Gila.....	22	8,000	45,000	12,000
Purdy.....	10	9,000	25,000	7,000
Contreras.....	7	3,000	9,000	2,000
Saunders.....	10	5,000	25,000	4,000
Araby.....	8½	3,500	35,000	2,000
Antelope.....	7	2,000	10,000	2,500
Toltec.....	3	30,000	15,000	.....
Total.....	120½	77,100	\$37,000	81,000

In the event of the completion of the above-described works in accordance with the original plans of the projectors, the total length would reach 241 miles, reclaiming 267,000 acres of bottom, valley, and mesa land, at an estimated cost of \$1,318,000.

The canal of the State of Arizona Improvement Company, when completed, will redeem an immense tract of fertile land above and below the town of Yuma. It has its head on the east bank of the Colorado River, will be 40 miles in length and 60 feet wide at the bottom, having a carrying capacity of 6 feet in depth of water at all seasons of the year.

The "duty" of water is not constant, but varies according to the locality. The quantity used per acre under the Lower Gila Valley canals is rated at about one-third of an inch. It should be explained that but little of the land has been irrigated earlier than three years ago, and, being virgin soil, requires more water than will be necessary during the coming seasons. For this reason it is fair to assume that the duty per inch will be materially increased.

It may be stated incidentally that by irrigation the fertilization of land fluctuates according to the nature and quantity of the silty matter deposited upon it by the water, and this, it is estimated, is from 30 to 100 per cent. Both the Gila and the Colorado are especially rich in such matter, and therefore the constant fertilization effected through the operating canals renders any further enrichment of the soil superfluous, useless, and unnecessary.

SCHOOLS.

There are nine public schools in Yuma County and one high school. Twelve teachers are devoting their time to the education of over 600 scholars. The average school term is seven months.

The high school in the Yuma district is presided over by a thoroughly competent professor, and the graded schools of this district require the services of four teachers.

The Catholics have also a parochial school presided over by the Sisters of St. Joseph. It is in a prosperous condition.

NEWSPAPERS.

There are two newspapers published in the county, the Arizona Sentinel and the Yuma Sun. Both papers are published in the village of Yuma.

CHURCHES.

There are two regularly organized churches in the county, viz, the Roman Catholic and the Methodist. These are in a flourishing condition and are well attended.

RIVERS.

The Gila.—The Gila River, though second in size to its mighty rival, the Colorado, is destined, for the present, at least, to figure far more prominently in the solution of the problem of redeeming and making valuable to the husbandman the immense bodies of hitherto arid and valueless land tributary to it.

The Gila drains a vast territory. Rising in the western part of New Mexico, it flows in a nearly westerly direction through the entire Territory of Arizona. Its northern and eastern sources are among mountains covered for several months in the year with snows of varying depths, the melting of which, added to the many natural springs emptying into it at different points, form a considerable river long before it passes through Graham County. It enters the Gila Valley some few miles above Florence. Thence for nearly 300 miles it winds through the now famous Gila Valley, eventually merging into the larger stream at the village of Yuma. The total length of the river is 650 miles. Before reaching the eastern boundary of Yuma County it is fed by numerous rivers, among the most important being the San Pedro, a stream rising near the line between Sonora, Mexico, and Arizona. Along the course of this tributary the rainfall is, perhaps, greater than elsewhere in Arizona, being estimated at 24 inches yearly.

Another noble tributary is the Salt River, in itself a large stream, having its head waters in the White Mountains. It enters into the Gila some distance below Phoenix. An important adjunct toward increasing the volume of the Salt River is the heavy rainfall about Prescott, amounting during the last ten years to an average of 15.18 inches annually.

Other rivers, like the Agua Fria, Hassayampa, the Santa Cruz, etc., bring down further supplies drained from the heavily timbered mountain regions traversed by them in the north and from the mountainous regions of the south.

Thus, for the major portion of the year, the Gila carries a large stream, more than sufficient, in fact, to irrigate a domain princely in extent. None of the rivers so far touched upon, however, are navigable.

The Colorado.—The Colorado River is formed by the union of the Green and Grand rivers. The former rises in Wyoming, the latter in Colorado. From their junction, the stream takes the name of the Colorado, and, following a generally southerly course, empties into the Gulf of California. The entire length, including tributaries, is over 1,200 miles. It flows during the low-water period at a rate not exceeding 4 miles per hour, although, of course, the speed is very much greater when the river is high. Among its principal feeders are the Rio San Juan, the Colorado-Chiquito, the Bill Williams Fork, and finally, as already explained, the Gila.

The Colorado constitutes the entire western boundary of Yuma County, its total length between the Sonora line and the Bill Williams Fork—the latter forming its northern boundary, separating, as it does, the counties of Yuma and Mohave—being about 235 miles. It is navigable for nearly 650 miles, from the Gulf of California to the Virgin River, by steamers registered and licensed through the customs district of Paso del Norte. The river is capable of affording at all periods an almost incredible amount of water for irrigation purposes, sufficient, in fact, to bring hundreds of square miles of fertile lands on each side of the river under cultivation, besides supporting an enormous population.

LANDS AND SOILS.

Within the limits of Yuma County there are large aggregations of Government land. The majority of the most favorably situated in the valleys were the first taken, the early pioneers occupying the tracts nearest the rivers, for the reason that they could be more cheaply irrigated. The mesas are for the most part unoccupied, although they comprise much of the most desirable land, such especially as are adapted to the growth of the citrus and other semitropical fruits. Water can not easily be brought upon them on account of their elevation above the river bed. Canals capable of carrying sufficient water for irrigation would entail comparatively heavy expense, because many miles must necessarily be constructed before the water can be brought to the surface. Such outlay would prove too expensive for the slender resources of the average settler; and so, as matters stand, they lie idle under the rays of a semitropical sun, untouched by the spade and plow. This condition of things, however, can not long continue. Neither physical nor topographical difficulties exist that can not be surmounted by the expenditure of a reasonable amount of capital; and consequently it is only a matter of time when the completion of

works of this nature will be effected by private corporations, or better still, by the Government.

It may safely be assumed, in view of what has just been said, that the large bodies of available agricultural land are confined to the valleys of the Gila and Colorado, and also to the comparatively level plains stretching from the Gila River to the Mexican line.

THE GILA VALLEY.

The Gila Valley is by far the most important of the two from an agrarian standpoint. It extends from the Gila Canyon, near the junction of the San Pedro River, westerly to the east bank of the Colorado, a distance slightly exceeding 250 miles. That portion of it situated in the county of Yuma, known as the "Lower Gila Valley," is about 100 miles long by from 2 to 10 miles wide, all of which is susceptible of profitable cultivation. The river from which it takes its name cuts the valley in two. Its watershed extends some 30 miles north, and upward of 50 miles south of its channel, the land from either extreme inclining more or less rapidly toward the stream. The Gila traverses a marvelously fertile country, very great in extent and splendidly adapted to the cultivation of nearly all the products of the temperate and semitropic zones, besides many of the fruits common in the tropics. Nor is this longer a matter of idle speculation, for flourishing ranches in various portions of the valley, drawing water from several important canals, amply demonstrate the magnificent results that will ensue should the water supply be rendered permanent, equitable, and adequate through appropriate storage systems.

The following, taken from that excellent work, "The Handbook to Arizona," by R. J. Hinton, alluding to the valley in question, is interesting and accurate:

"This consists of a broad expanse of tillable valley land, sometimes overflowed by the river, which is at times 'mighty uncertain,' and a steep range of volcanic hills coming close to the highways, for a dozen miles or so hot, heavy, and sandy. It is hardly fair to say sandy, as it is really a friable, alluvial loam, of grayish hue and loose texture. Several ranches are passed, showing that the Gila bottom is cultivable. With irrigation every square mile of the Gila Valley is capable of producing prolific crops of grain and semitropical fruits, as well as cotton and sugar in great abundance. The river is able to furnish all the water needed, and a good deal more. It would take no very great skill in engineering, and not a very large sum of money either, to construct reservoirs or lakes in which to receive and store the overflow. There are natural basins or dry lakes into which, by simple means, the water could be conveyed."

The lands situated in and about the Gila Valley may conveniently be classified as follows:

- (1) The bottom or overflowed lands.
- (2) Slightly higher valley lands not subject to overflow.
- (3) Mesas, or sloping uplands.
- (4) High, but comparatively level plains.
- (5) Mountains.

THE BOTTOM AND HIGHER LANDS.

The bottom lands, as well as those slightly higher, stretch along either side of the Gila River for varying distances north and south, until they meet the more elevated mesas which rise from the valley. The bottoms lie directly along the river and are subject to inundation annually. Immediately following the subsidence of the waters, the local Indians were, in former times, accustomed to plant corn, pumpkins, melons, and other vegetables. These sprung into maturity with startling rapidity, rarely failing to yield bountifully without additional irrigation. The custom is occasionally followed by resident farmers to this day with excellent results, although but a single crop can be harvested. These bottoms form perhaps 25 per cent of the valley lands, and may without difficulty be secured from further invasion by a system of dikes and levees, if deemed necessary or desirable. The soil throughout the valley is a rich brownish yellow, sandy loam, generous, mellow, and porous, with a depth ranging from 6 to 20 feet, the whole resting upon underlying strata of gravel and sand that readily carry from the surface such excess of water as might otherwise prove injurious to seeds and growing plants.

Concerning the geological formation of these lands, the following from the report of the citizens' executive committee is sufficiently comprehensive:

"There is unmistakable geologic evidence that the entire lower Gila Valley was, during some prehistoric period, covered with water, constituting in fact an enormous lake, the surface rising in places to the upper portion on the outskirting mesas. The soil lying at the bottom was made by the washing and erosion of the surrounding mountains. The soda from the decomposed vegetation, the magnesia and lime from the magnesium-lime formations, and the potash from the decomposing granite rocks

were carried with unceasing regularity, year by year, until deposited in the bottom. Eventually, upon the disappearance of the lake, the rich, fertile alluvium, than which there is none better, was left to reward the efforts of the modern husbandman. But nature, not yet satisfied with her handiwork, directed the accumulation of the detritus washed from the distant mountainous region. As a result, the soil is extremely rich in the elements best adapted to thorough fertilization, for it contains a certain amount of organic matter which, on decomposing, further enhances its agricultural value. By constant overflow and change of channel, the deposits are evenly distributed over considerable areas, the process continuing through centuries. These soils are further enriched by decomposed inorganic contributions, including the sandstones, marls, limestones, shales, etc. Besides the ingredients mentioned, a chemical analysis shows that iron, ammonia, and phosphoric acid enter into its composition in the proportions best adapted to add to its fecund qualities. The extremes of temperature are somewhat greater than on the highlands, but there is also more moisture."

The bottom lands are so easy of cultivation that it is not uncommon, after clearing the surface from brush and stubble, to pass over the ground with an ordinary cultivator a single time, afterwards sowing to grain and grass. In three or four months large crops are harvested, the soil meanwhile being entirely innocent of the plow. All plants seem to grow rapidly, maturing remarkably early. Indications of ancient ditches are apparent throughout the valley, showing plainly the existence of irrigation works by the ancient Aztecs. Curiously enough, in certain instances, the identical routes of these long-extinct people have been followed for considerable distances by their modern successors.

THE MESAS.

The mesas are warmer, and better adapted to the cultivation of citrus fruits. The soil is also somewhat different, being of a reddish color, loose enough to receive water without causing the ground to bake, and while of a loamy nature, is more sandy or gravelly. It is in addition lighter but therefore better adapted for the raising of the fig, the olive, and the various kinds of wine grapes. Indeed, it has been asserted by several of the most experienced wine growers of California that these very mesas are better calculated for the production of the true port and sherry grapes than any of the lands within the borders of their own grand State. It is claimed that wine can be made possessing great preserving qualities, such as would allow of improvement year by year instead of deterioration. These lands are greater in area than those directly upon the river, and almost imperceptibly slope away from the distant mountains. The drainage is admirable, not too excessive, and just sufficient to carry off surplus water. Vegetables, grasses, grains, sugar beets, and cane, cotton, and, in truth, almost everything can be successfully raised.

HIGH PLAINS.

These include extensive bodies of land connecting with the mesas along the south side of the Gila Valley. So gradual is the slope that they hardly deviate from the horizontal. At the highest point southward they as gently incline toward the Mexican line, the slope in this case being directly opposite to that along its northern base.

In the latter instance it is first toward the mesas, and from thence, indirectly, to the river. The soil is very similar to that of the mesas, the two classes exhibiting common characteristics. Like the mesas, these plains are susceptible of the highest cultivation, providing always that ample irrigation facilities are afforded. Here and there they are crossed arbitrarily by mountain ranges, which do not all tend in the same direction, but they present no important engineering obstacles to the canal builder.

The wonderful fertility of the bottoms and other valley lands, as well as the mesas and plains, is established beyond denial by actual experimentation. Neither is the soil likely to degenerate in the future, for in answer to the question, "Will it last?" O. L. Wheeler, D. D., LL. D., a recognized expert in such matters upon the Pacific coast, says:

"To this query the answer in general is, the longer land is properly cultivated and properly fertilized the stronger and more productive it becomes. While the mountains surrounding the valley continue to disintegrate under the operation of the elements, and while the detritus thus eliminated continues under the laws of gravitation to descend and work its way over the plains, so long will there be perennial additions to the amount of producing element in a state of refinement and assimilation. And so long as the water flowing from these mountains, holding in solution the debris, which always, in some degree, is spread upon the land in irrigation, so long will the fertilizing properties of the soil continue to receive additions and its fecund power continue to be increased. And so long as the water containing more or less of salts and ammoniac compounds, as all water does, is used for

irrigating purposes, and so long as the process of cultivation continues to throw up the soil, exposing it to the indispensable and ever-fructifying influence of the atmosphere, so long will the soil continue to be refreshed and invigorated and prepared to give large rewards to the labor of the husbandman."

MOUNTAINS.

The mountains forming the last and outer environments are, of course, in no way to be discussed. Nevertheless, they play an important part in the advancement of the agricultural interests of the valley by shielding more or less the lower lands from the effects of the high, strong winds that prevail at times. They also form a protection and shelter to range cattle.

The total acreage of the Gila Valley and outskirting lands, as just described, is estimated at 600,000 acres, of which there are 33,000 acres of bottoms, 97,000 acres of higher valley lands, and 470,000 acres of mesa and level plains. By far the largest portion of the valley has been filed upon under one or other of the Congressional enactments. The entire amount under actual cultivation will probably not exceed 15,000 acres at the present time, but it is believed that during the coming autumn and winter from 3,000 to 5,000 acres additional will be worked.

THE VALLEYS OF THE COLORADO.

Concerning these we print the following, taken from the report of the citizens' committee of Yuma County, which report has already been referred to:

"Several miles above Yuma, in the neighborhood of Explorer's Pass, near the Purple Hills, the great Colorado Valley proper commences. From this point north-erly the river is shut in by cliffs which, with intervening mountain systems, absolutely preclude the possibility of canal construction. Passing southward, the cliffs are seen to gradually disappear until they become merged in the low bottom lands. The valley meanwhile widens with every mile until the Gulf of California is reached. There are large quantities of land which could be made productive were irrigation practicable. These are generally fertile bottoms, inclining toward the river, and covered in spots with dense undergrowth and cottonwood and mesquite trees. Considerable of the valley is raised above the river as much as 100 feet; and to this height water must be brought, as the bottoms are, during certain months, completely overflowed by the waters of the swollen stream. The soil is extraordinarily rich, and particularly adapted to the cultivation of sugar, rice, and all the textile plants, in addition to an extended list of tropical, semitropical, and temperate products. According to careful chemical analysis, the fertilizing reddish mud carried by the Colorado closely resembles that of the waters of the Nile, while its volume at low water has been estimated by competent authority as sufficient to easily irrigate more than 1,750,000 acres."

MINES AND MINING.

There is no section of the United States, or probably of the earth, more rich in mineral wealth than the county of Yuma. All the country north, east, and south of Yuma lies directly within the main gold belt that reaches from Alaska to Mexico.

From the San Bernardino Mountains, in California, to the Sonora boundary line the mountains and hills are exceptionally rich in the precious metal, as though demonstrating the theory often advanced that the richest gold mines are found bordering the beds of extinct oceans.

The great Colorado desert was once an inland sea, cut off centuries and perhaps ages ago from the main ocean, leaving its waters to evaporate in this intense heat. Throughout all the country bordering the desert, including this section, rich mines are being constantly discovered, and some of recent location are already producing immense profits. In the neighborhood of Yuma claims exceedingly rich on the surface are being discovered, and all signs portend a great mining boom for this country, which will culminate as early as the coming fall in an inroad of much capital.

Experts are arriving every week, and mines are being bonded at more than heavy prices. It seems wonderful to believe that all this mineral wealth has been lying at our very doors for so many years without a taker; but the tendency of prospectors is to go a long way off to strange lands rather than to seek for mines in a county as old as Yuma County and so accessible. The greater the distance, the hardship, the danger, the greater the fascination for the prospector. Distance seems indeed to lend enchantment to the view. So it is that this country is almost a virgin field for the mine hunter, and now, with the few hundreds searching in its mountains, its mineral secrets are still in effect secrets, for thousands upon thousands might be wandering through the rock-ribbed fastnesses of our mountain ranges and their presence be almost unknown, so vast is the extent of the country.

The production of precious metals in Yuma County is now \$100,000 per month, and it is safe to predict that within a year the output will increase to twice that amount. This estimate is based upon the large number of immensely rich gold discoveries made within the last year, on which extensive development work is now being done. New reduction works are being erected, and an encouraging enthusiasm prevails throughout every district of the country. While Yuma County is a distinctively gold-producing county, other metals are found in abundance, though not extensively mined. Large quantities of lead and silver ore are being shipped to the smelter at San Francisco for reduction, and despite the long haul and high freight rates yield handsome profit to the operators.

The county is well supplied with all the fluxes necessary to the successful operation of the smelters, the erection of which must surely follow the rapid development of immense deposits of refractory ores recently discovered. The establishment of a smelter in Yuma, under competent management, would increase the production of gold, silver, copper, and lead to a marvelous figure.

Many veins of copper ore of a high grade, all of which carry more or less gold, have been located within the last few months, which only wait the creation of a reduction works to become large contributors to the world's wealth.

The placer grounds of the Colorado and Gila rivers, as well as a number of the smaller streams, are rich in gold, and only await the investment of a sufficient capital to construct storage dams and erect suitable machinery for the purpose to make Yuma County the most productive mining district of the Southwest. Hundreds of men are now working the richest ground with the most primitive appliances, such as rockers and dry washers, and making good wages.

Of the rare precious metals found in the county, cobalt, bismuth, vanadium, molybdenum are the most prominent. Precious stones, such as garnets, opals, jasper, turquoise, tourmaline, and chalcedony have also been discovered in various parts of the county, but as yet no development of importance has been done.

PRODUCTS.

Fruit culture has so far been prosecuted upon a somewhat limited scale, but enough has been learned from experimental tests to demonstrate the positive feasibility of not only producing an excellent quality of the most profitable fruit, but also the ability to raise them for market from three to six weeks earlier than any section of California.

Concerning the various products of the county, we quote again from the report of the citizens' committee:

"The orange, lemon, and lime, finding soils and climate congenial, yield in abundance large, clean-skinned, and exceedingly luscious fruit. They color handsomely, contain the requisite acidity and sweetness, and are very juicy.

"The fig and pomegranate offer a character of fruit that almost stamps them as indigenous. The latter is not yet recognized to any great extent, but it will certainly become an important factor in arboriculture when its economic qualities are better known. As to the fig, the most desirable variety has yet to be determined. The true 'White Smyrna' would probably prove the best, and that its yield would be prodigious goes without saying, for the tree will bear three crops annually. This assertion is based upon actual productive results of the 'Mediterranean White' fig, that is known not to be the true Smyrna.

"The grape seizes upon what is proffered to it and becomes hardy, thrifty, and adaptable. The choice naturally inclines to the earliest for table purposes. What those varieties should be is in process of experiment upon a scale that will soon solve the question, but it may be said that all kinds mature from three to four weeks before they do in California. They attain great size, cluster tightly on the bunches, are firm and highly colored, and possess exquisite flavor. Heavy wines and brandies of a superexcellent character can be made, but with light wines the reverse is true, for everything apparently goes to saccharine. For ripening wines the climatic conditions are admirable. A quantity of common white wine, costing 45 cents per gallon, was brought here from California by water years ago, and, on being found unsalable, was placed in cellars and its history almost forgotten. Nine years later the wine was brought to light, when it was discovered that it resembled a brown sherry, rich in bouquet, smooth as oil, and delicious to the taste. It was carefully drawn from the casks, bottled, and sold at \$2.50 per bottle.

"The olive grows luxuriantly, and will in the future become a most profitable investment. Whatever its characteristics elsewhere, here it requires water and cultivation—the more water the better.

"The mulberry matures rapidly, and when firmly rooted vigorously withstands great heat and lack of water. It produces an early, large, and sweet fruit, and is a highly desirable tree to plant along the canals for its grateful shade.

"The plum can be easily raised from the seed. It fruits early, though so far the

product does not commend itself particularly for table use, but as a stock upon which to ingraft prunes, or even superior varieties of plums, it is everything to be desired. An experiment in this line with the best prune known in California showed a growth of 23 inches in forty days from the insertion of the graft.

"The date has passed beyond conjecture. The plant produces magnificently, and its cultivation will be prosecuted more extensively this winter than ever before. The soil is in every way suitable, and with occasional cultivation and intelligent irrigation a quick and early growth is assured.

"Apricots and peaches have been tested. They mature rapidly, bear choice fruit, and are always healthy, giving flattering indications of future success.

"As facilities increase other fruit trees will be introduced, and with the same care that is bestowed upon them elsewhere will, so soon as they become acclimated, come to a yield materially in advance of the place from whence they came. The field is too large to admit of extended comment at this time, but it may suffice to refer briefly to certain other products which may in time equal, if not surpass, fruit growing as a commercial proposition, as, for example, cotton, wild hemp, ramie, sugar cane, sugar beets, etc.

"Cotton has been tried from time to time, for years, with varying but always satisfactory results, and even then without care. If watered regularly, it becomes a large bush, and if properly pruned, a tree, being in flower, boll and cotton the year round. These bushes and trees have, in instances, borne steadily for fourteen years. The staple, of course, diminishes in course of time, but at ten years it is not inferior to the average staple of Western India.

"Wild hemp is a textile plant indigenous to the country. It grows freely and luxuriantly to a great height, often averaging from 15 to 17 feet. It has a long, strong fiber, and is frequently worked into nets and fishing lines by the Yuma Indians. Convulsive attempts have been made to utilize this plant, with the practical result of fixing its value among the fibers used in the manufacture of cordage at about \$160 per ton of 2,000 pounds. After proper bleaching and manipulation, a beautiful fiber has been produced and manufactured into colored fabrics, taking the dye and retaining the elasticity and luster exactly as well as the fabrics of true flax and ramie. It seeds itself annually, and, immediately following the overflows of the Colorado River, takes possession of every nook, corner, and open area, to the exclusion of everything else. It covers not less than 100 square miles in an unbroken stretch, commencing near the boundary line of the Gadsden purchase and extending southward along the river to Hardy's, Colorado, below the point where the rising tides of the Gulf of California force back the flow of the Colorado River proper.

"The fibrous plant ramie has been given a partial trial. The soil, on analysis, was found to contain all the essential properties to render the most favorable results, but the absence of water, together with injudiciously planting the roots too late, retarded the growth. Enough data was obtained, however, to warrant the belief that this will eventually become one of our most important industries.

"Sugar cane has been fairly tested with the Sonora cane. The growth was surprisingly great, and the percentage of juice much increased over the yield at the place from which it was originally brought. A superior quality of panocha and syrup was manufactured, the prices realized leaving handsome margins for profit. The capriciousness of the water supply, as in the case of ramie, dissolved the industry, and it has not since been revived.

"The sugar beet promises better results for the future than many of the products already mentioned as prominent in the same direction. Samples not fully matured polarized 17 per cent. With proper cultivation the percentage can be raised to from 20 to 25, and, besides, will harvest two crops each year.

"Wheat does splendidly, but complete data are not at hand from which to compute the average yield. In one instance, however, 483 pounds seeded to 20 acres, about 9 miles east of Yuma, on the Gila River, returned 52,750 pounds, after having been irrigated five times. This was sold in San Francisco, bringing 50 cents per cental over every other kind then in the market. The grain is remarkable for its plump, berry-like appearance. The winter and spring are warm enough to insure a vigorous growth, and cool enough in April and May to allow the heads to fill out without shriveling. It is so perfect as to sell for seed, and, so far as known, is proof against rust. Two crops are raised annually.

"Barley also does well, and will produce two crops—the first yielding from 35 to 40 bushels of barley and the second a large amount of hay.

"Corn is produced in great quantity, yields enormously, and can be grown the year round. The 'Cocopah' corn is noted for sweetness, plumpness, earliness, and for its firm and solid grains. Five weeks after planting, roasting ears are plentiful. This variety commands a ready sale at higher prices than any other kind.

"Alfalfa will cut from five to seven times at an average of 2½ tons to the acre. Eight acres, but one year old, have this year yielded 74 tons, with more cuttings yet to be made. The hay brings \$15 per ton.

Sorghum, raised for feed, is both valuable and prolific. It frequently reaches 15 in height, yields from 15 to 20 tons per acre, and is worth \$15 per ton. Several crops can be harvested annually.

Vegetables, kitchen and garden stuff, melons, etc., grow all the year round in limited quantity and excellent quality. Some time since, a Gila Valley farmer raised 15 pounds of Irish potatoes on a piece of bottom land that had been over-looked, from which he harvested over 700 pounds; and this record, it is believed, has rarely, if ever, been excelled. The sweet potato produces enormously, and equals the choicest brought from South Carolina.

Peanuts mature rapidly and abundantly, yielding a nut both plump and tooth-

some. Whenever there is sufficient moisture, the natural flora abound in profusion and variety. They are of rare beauty and delicious fragrance, the bulbous plants particularly. The lily surpasses the famous imported 'Japan.' It has been claimed by writers that at no distant period opium will be manufactured from the poppy and derived from the rose, both flowers thriving vigorously. There are but few trees and shrubs capable of adorning the surroundings of a lovely modern home that can not satisfactorily grown.

Every plant, vine, or tree mentioned in the foregoing list has been actually proven adaptable to our soils and climate. Many others have been omitted through lack of space, but there seems no doubt that time will demonstrate our ability to profitably raise all the semitropic and most of the tropical and temperate productions."

CONCLUSION.

In the valleys of the Colorado and the Gila rivers there is room for thousands. It is not too much to say that nowhere within the limits of this broad Union can be had a more desirable region for the making of a home. No laborious clearing of land is required; it lies almost ready for the plow. Trees and shrubbery have attained a growth that within eighteen months the immigrant can surround himself with attractions which would require years to mature in less favored climates. Fruits ripen and are ready for market a full month before the California product. Bright sunshine makes life a luxury, and the pure dry atmosphere brings health to all who inhale it. For the establishment of colonies, such as are made in south-California, Arizona presents unrivaled opportunities. Thousands of acres, now worthless, can be made productive by the construction of irrigating ditches, and there is no investment which assures larger or more permanent returns.

The statements in this article on Yuma County are not exaggerated; in fact, they are short of doing justice to this wonderful bit of country. Pineapples, dates, figs, and walnuts will do well. Strawberries, raspberries, blackberries, currants, gooseberries, and all varieties of small fruits can be successfully cultivated. Indeed, Yuma County is not only the natural home of the citrus and semitropical fruits, but almost every fruit, nut, plant, grain, grass, or vegetable which can be produced in either tropic or temperate zone will thrive in its rich and fertile soils. With the bright prospects ahead of the town of Yuma and Yuma County, there can be no better investment for capital seeking large and remunerative returns than afforded there. With a matchless climate, where all forms of disease known to the tropic and rigorous regions of the East and North are unknown; where the bright sunshine kisses into bloom and fragrance every form of vegetation, and where the warm days and cool and balmy nights are one long-continued poem of happiness and health, we can offer to capitalists an ideal field for investment and to home seekers a veritable paradise in which to settle.



TERRITORIAL CAPITOL BUILDING AT SANTA FÉ.

REPORT
OF THE
GOVERNOR OF NEW MEXICO FOR THE YEAR
ENDING JUNE 30, 1898.

SANTA FE, N. MEX., *October 1, 1898.*

SIR: In obedience to your request, I have the honor to herewith transmit to you my report of the Territory of New Mexico for the year ending June 30, 1898, showing the progress and development of our Territory during that period.

I desire to call special attention to the following subjects contained in my report: Statehood, cattle, sheep, and wool; remarks concerning the old adobe palace at Santa Fe; irrigation, population, increased valuations, sugar-beet culture, appropriations, and New Mexico's war record.

Referring again to the above subjects, I wish to call your particular attention to the report on irrigation gotten up by Mr. P. E. Harroun, C. E. This report has taken considerable time and attention, and is worthy of more than a passing consideration, irrigation being a most important factor in our Territory.

I have the honor to be, sir, your most obedient servant,

MIGUEL A. OTERO,
Governor of Territory of New Mexico.

The SECRETARY OF THE INTERIOR,
Washington, D. C.

NEW MEXICO.

The Territory of New Mexico has an average breadth of 335 miles; length of eastern boundary, 345 miles; length of western boundary, 390 miles.

By geographical divisions New Mexico is bounded on the north by the State of Colorado, on the east by the public domain and the State of Texas, on the south by the State of Texas and the Mexican States of Chihuahua and Sonora, and on the west by the Territory of Arizona.

Of the 123,000 square miles, or nearly 79,000,000 acres, there are about 24,000,000 acres contained in land grants, Indian and military reservations, railroad grants, and Government entries, which leaves an available area of about 55,000,000 acres of land, capable of supporting a population of several millions of people.

Should Congress see fit to admit New Mexico into the union of the States, she will be the fourth in area.

The Territory of New Mexico is rich in everything that constitutes the wealth of nations—iron, coal, lead, silver, gold, mica, limestone, sandstone, marble, gypsum, soda, fireclay, etc., in endless varieties and inexhaustible quantities.

OFFICIAL REGISTER.

Territorial officers.—Governor of the Territory of New Mexico, Miguel A. Otero, Las Vegas, N. Mex.; private secretary to governor, Miss N. P. Crane, Santa Fe, N. Mex.; secretary of the Territory, George H. Wallace, clerk in secretary's office, C. P. Wallace; solicitor-general, Edward L. Bartlett; auditor, Marcelino Garcia; treasurer, Samuel Eldodt; superintendent of Territorial penitentiary, Edward H. Bergmann; superintendent public instruction, Manuel C. de Baca; librarian, Jose Segura; adjutant-general, William H. Whiteman; mine inspector, J. W. Fleming; coal-oil inspector, John S. Clark.

Judiciary.—Chief justice of the supreme court and judge of the fourth judicial district, William J. Mills; clerk, Secundino Romero; clerk of the supreme court, Jose D. Sena. Associate justices of the supreme court: First judicial district, John R. McFie; clerk, A. M. Bergere. Judge second district, J. W. Crumpacker; clerk, H. P. Owen. Judge third judicial district, Frank W. Parker; clerk, J. P. Mitchell. Judge of the fifth judicial district, Charles Leland; clerk, John E. Griffith.

Delegate in Congress.—H. B. Fergusson.

Surveyor-general.—Quinby Vance.

United States revenue collector.—A. L. Morrison.

United States district attorney.—W. B. Childers.

United States marshal.—C. M. Foraker.

Deputy United States marshal.—C. A. Coddington.

Registers and receivers, land offices.—M. R. Otero, register, and Edward F. Hobart, receiver, Santa Fe, N. Mex.; Emile Solignac, register, and H. D. Bowman, receiver, Las Cruces, N. Mex.; Howard Leland, register, and George R. Guyer, receiver, Roswell, N. Mex.; Edward Fox, register, and A. W. Thompson, receiver, Folsom, N. Mex.

District attorneys.—Charles A. Spiess, Santa Fe; John D. Bryan, Las Cruces; T. A. Finical, Albuquerque; T. S. Hefflin, Silver City; L. C. Fort, Las Vegas; John Franklin, Roswell; S. Alexander, Socorro; J. Leahy, Raton; E. W. Hulbert, Lincoln, N. Mex.

Public printer.—J. D. Hughes.

Indian agent.—N. S. Walpole.

Court of Private Land Claims.—Chief justice, Joseph R. Reed. Justices: W. W. Murray, Henry C. Sluss, Thomas C. Fuller, and Wilber Stone; attorney, Matthew G. Reynolds; clerk, J. H. Reeder.

Officers of Territorial institutions.—The governor and superintendent of public instruction are ex officio members of the board of regents of the following institutions: The University of New Mexico, the New Mexico College of Agriculture and Mechanic Arts, the New Mexico School of Mines, the New Mexico Insane Asylum, and the New Mexico Military Institute.

The University of New Mexico.—Regents: W. B. Childers, Albuquerque; E. S. Stover, Albuquerque; Juan C. Armijo and F. W. Clancy, Albuquerque; H. L. Waldo, Las Vegas, N. Mex.

New Mexico College of Agriculture and Mechanic Arts.—Regents: G. A. Richardson, Roswell; A. A. Jones, Las Vegas; Jacinto Armijo, Las Cruces; P. H. Curran and J. D. Bowman, Las Cruces, N. Mex.

New Mexico Normal School, Silver City.—Regents: J. W. Fleming, Silver City; W. G. Ritch, Engle; J. A. Mahoney, W. A. Hawkins, and Jo. E. Sheridan, Silver City, N. Mex.

New Mexico Normal School, at Las Vegas.—Regents: C. L. Rudolph, Las Vegas; Charles Ilfeld, Las Vegas; M. W. Browne, Las Vegas; Frank Springer, Las Vegas; Rev. George Selby, Las Vegas, N. Mex.

New Mexico School of Mines, Socorro.—Trustees: J. P. McGrorty, Deming; John Y. Hewitt, White Oaks; Juan Jose Baca, Socorro; J. G. Fitch, Socorro; C. T. Brown, Socorro, N. Mex.

New Mexico Military Institute, Roswell.—Regents: Joseph C. Lea, Roswell; Nathan Jaffa, Roswell; J. O. Cameron, Eddy; John W. Poe, Roswell; Robert S. Hamilton, Roswell, N. Mex.

New Mexico Insane Asylum, Las Vegas.—Directors: F. S. Crosson, Raton; M. Brunswick, Las Vegas; J. W. Zollars, Las Vegas; Benigno Romero, Las Vegas; F. H. Pierce, Las Vegas, N. Mex.

Territorial board of education of New Mexico.—Members: Governor; superintendent public instruction; president of St. Michael's College at Santa Fe; president of University of New Mexico; president New Mexico College of Agriculture at Las Cruces, N. Mex.

Board of penitentiary commissioners.—C. F. Easley, Santa Fe; O. A. Hadley, Watrous; Henry J. Young, Cerro; F. Miera, Miera; S. Baca, Lincoln; J. F. Chavez, Pinos Wells; D. S. Miller, Lake Valley.

Capitol custodian committee.—Secretary of the Territory ex officio, Santa Fe; Manuel Valdez, Santa Fe; Solomon Spiegelberg, Santa Fe.

Territorial board of equalization.—Romulo Martinez, first judicial district, Santa Fe; Thomas Hughes, second judicial district, Albuquerque; D. C. Hobart, third judicial district, Silver City; J. S. Duncan, fourth judicial district, Las Vegas; George L. Ulrick, fifth judicial district, Whiteoaks.

Cattle sanitary board.—J. F. Hinkle, Lower Penasco; W. H. Jack, Silver City; F. J. Otero, Albuquerque; T. E. Mitchell, Clayton; M. N. Chaffin, Las Vegas.

Board of medical examiners.—G. S. Easterday, Albuquerque; W. Eggert, Santa Fe; J. H. Sloan, Santa Fe; Joseph Cunningham, Las Vegas; W. R. Tipton, Las Vegas; C. B. Kohlhausen, Raton; J. W. Kensinger, Roswell.

Board of dental examiners.—J. B. Brady, Santa Fe; F. E. Olney, Las Vegas; L. H. Chamberlin, Albuquerque; W. H. White, Silver City; A. A. Bearup, Roswell.

Members of the board of pharmacy.—A. J. Fischer, Santa Fe; W. C. Porterfield, Silver City; B. Ruppe, Albuquerque; E. G. Murphy, Las Vegas; M. G. Padin, Whiteoaks.

Members of the Bureau of Immigration.—J. D. Hughes, first judicial district, Santa Fe; F. Lowenthal, second judicial district, Albuquerque; W. H. H. Llewellyn, third judicial district, Las Cruces; F. A. Manzanares, fourth judicial district, East Las Vegas; Lucius Dills, fifth judicial district, Roswell, N. Mex.

Register of the thirty-second legislative assembly.

COUNCIL.

Members.	Post-office.	Districts, by counties.
Francisco Miera.....	Miera	Colfax, Mora, and Union.
J. S. Duncan.....	East Las Vegas.....	San Miguel and Guadalupe.
Plácido Sandoval.....	El Porvenir.....	Do.
Antonio Joseph.....	Ojo Caliente.....	Taos, Rio Arriba, and San Juan.
J. M. Archuleta, jr.....	Lumberton.....	Do.
Charles A. Spices.....	Santa Fe.....	Santa Fe.
Thomas Hughes.....	Albuquerque.....	Bernalillo.
T. A. Finical.....	do.....	Do.
J. Francisco Chavez.....	Pinos Wells.....	Valencia.
W. E. Martin.....	Frisco.....	Socorro and Sierra.
A. B. Fall.....	Las Cruces.....	Donna Ana and Grant.
George Curry.....	Roswell.....	Grant, Donna Ana, Lincoln, Chavez, and Eddy.

HOUSE OF REPRESENTATIVES.

John Morrow.....	Raton	Colfax.
Marcelino Martinez.....	Cleveland.....	Mora.
Olán E. Smith.....	Clayton.....	Union.
José Y. Lujan.....	San Ignacio.....	San Miguel.
Francisco Lucero.....	Chaperito.....	Do.
Manuel A. Sanchez.....	Watrous.....	Do.
José Pablo Sandoval.....	Anton Chico.....	Guadalupe.
José D. Sosa.....	Santa Fe.....	Santa Fe.
Larkin G. Read.....	do.....	Do.
Malsquias Martinez.....	Taos.....	Taos.
Vencelao Jaramillo.....	El Rito.....	Rio Arriba.
Felix Garcia.....	Lumberton.....	Taos, Rio Arriba, and San Juan.
Juan N. Jaques.....	Largo.....	Do.
Gua. Mulholland.....	Gallup.....	Bernalillo.
Antonio Orita, jr.....	Pena Blanca.....	Do.
Herculano Garcia.....	Albuquerque.....	Do.
Maximiliano Luna.....	Los Lunas.....	Valencia.
Desiderio Sandoval.....	Cebolleta.....	Do.
F. A. Reynolds.....	Florida.....	Socorro and Sierra.
Clemente Castillo.....	Polvadera.....	Do.
W. H. H. Llewellyn.....	Las Cruces.....	Donna Ana.
William Cristman.....	Pinos Altos.....	Grant.
Joseph A. Mahoney.....	Deming.....	Donna Ana and Grant.
U. S. Bateman.....	Eddy.....	Lincoln, Chavez, and Eddy.

POPULATION.

The means of obtaining an accurate count of the population of the Territory has not improved since my last report to you. For that reason, the population can only be estimated, and without even the data which I had at hand when I made my last report. The estimate last year was made on the result of the general election held in November, A. D. 1896, the returns of which are on file in the office of the secretary of the Territory. Since that time, there has been no general election held in the Territory.

From information which I have received in response to inquiries addressed to all parts of the Territory, with a view of ascertaining the present population, I find that the greatest gain in population was made in the principal cities and mining districts of the Territory. There has also been quite an influx of new residents to the following districts which lie in the counties of San Juan, Colfax, Lincoln, Eddy, and Chavez. The mining districts of New Mexico continue to hold out attractive allurements to prospectors, the mining industry having received a great impetus in the districts of Cochiti, Red River City, Elizabethtown, San Pedro and Golden, and in Grant and Socorro counties.

The construction of irrigating ditches and reservoirs in the arid regions is reclaiming vast areas and preparing them for cultivation. The home seeker, coming from the more densely populated North and East, finds the conditions so favorable to the production of fruits and grains that each year he induces more and more of his neighbors from his old home to follow his example and take up the new lands of New Mexico and convert them into homes.

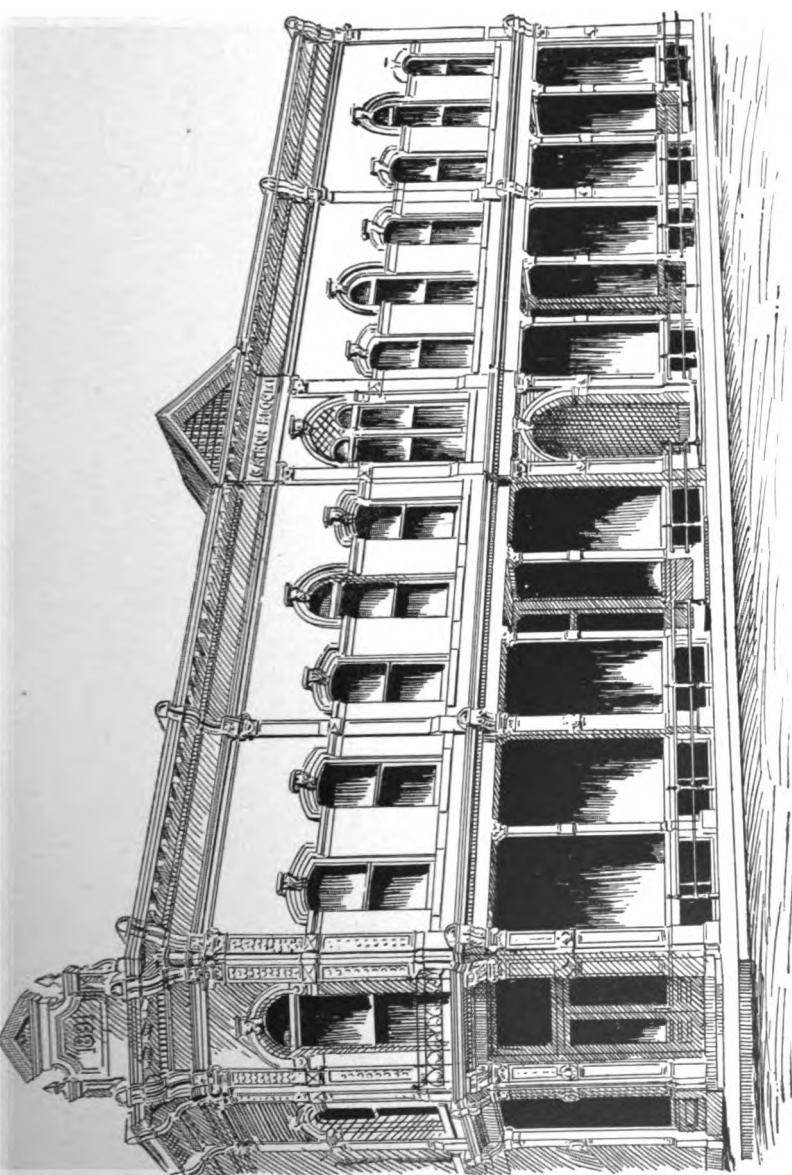
The following estimate of the population by counties is as nearly correct as it is possible to make it, to wit:

Bernalillo	35,000
Chavez	5,000
Colfax	14,000
Dona Ana	14,500
Eddy	4,000
Grant	14,000
Guadalupe	7,500
Lincoln	10,000
Mora	17,000
Rio Arriba	19,000
Santa Fe	21,000
San Miguel	35,000
San Juan	4,500
Sierra	5,500
Socorro	19,000
Taos	13,000
Union	7,000
Valencia	14,000
Total	257,000

The Indian population is estimated as follows:

Pueblos	8,600
Jicarillas	850
Mescaleros	450
Navajos	16,000
Total	25,900

This makes a total population of the Territory of 282,900.



BUSINESS BLOCK, SANTA FE.

OFFICE OF THE ADJUTANT-GENERAL,
Santa Fe, N. Mex., June 30, 1898.

SIR: Replying to your request of this date to furnish a report of the operations of the National Guard of the Territory of New Mexico and its condition on the 30th day of June, 1898, I have the honor to say that I can do little else than point with pride to the thinned ranks of the several organizations of the National Guard of New Mexico, as evidence of the patriotism and martial spirit of its members, and of their willingness to offer up their lives in defense of their country and its honor, and who have thus faithfully and loyally vindicated the purpose of its organization in speedily rallying to the country a body of trained, intelligent, well-disciplined citizen soldiers in the first hour of its need.

Under the President's call for volunteers to serve in the war against Spain the quota of New Mexico was fixed at four troops of cavalry—342 men and 15 commissioned officers—all of whom were promptly recruited, were among the first to answer "ready," and were immediately sent to the seat of war, where they comprise the New Mexico Squadron of the First United States Volunteer Cavalry, known as the "Rough Riders," and gallantly have they served, and won for themselves imperishable renown.

The following is a roster of the field and staff and troop officers and non-commissioned staff of the New Mexico Squadron of the First United States Volunteer Cavalry, mustered in May 7, 1898:

Maj. H. B. Hersey, commanding; First Lieut. James A. Massey, assistant surgeon; Herbert J. Rankin, James B. Brady, hospital stewards.

Troop E.—Frederick H. Muller, captain; William E. Griffin, first lieutenant; Sherrard Coleman, second lieutenant.

Troop F.—Maximiliano Luna, captain; Horace W. Weakley, first lieutenant; Maxwell Keyes, second lieutenant.

Troop H.—George Curry, captain; William H. Kelly, first lieutenant; Charles L. Ballard, second lieutenant.

Troop G.—W. H. H. Llewellyn, captain; John W. Green, first lieutenant; David J. Leahy, second lieutenant.

Troop I.—Frederick W. Weintge, first lieutenant.

Under the President's second call for volunteers the quota of New Mexico was four companies of infantry—424 men and 15 commissioned officers. The quota was promptly filled, and officers and men sent to Whipple Barracks, Ariz., where they constitute the New Mexico battalion of the Arizona, New Mexico, Oklahoma, and Indian Territory regiment of United States Volunteer Infantry, where they now are, ready for the field, and fearing nothing but that the war may be over before they have an opportunity to meet the enemy.

The following is a roster of the field and staff and company officers and non-commissioned staff of the New Mexico battalion of the Arizona, New Mexico, Oklahoma, and Indian Territory regiment of the United States Volunteer Infantry:

Lieut. Col. David D. Mitchell, commanding; First Lieut. H. M. Smith, assistant surgeon; Ernest C. A. Barber, hospital steward.

Company: John Borradaile, captain; Louis H. Chamberlain, first lieutenant; Louis A. M. McRae, second lieutenant. Mustered in July 6, 1898.

Company: William Clifford Reid, captain; William O. Morrison, first lieutenant; Albert L. Comstock, second lieutenant. Mustered in July 11, 1898.

Company: William Stover, captain; Page B. Otero, first lieutenant; John W. Catron, second lieutenant. Mustered in July 13, 1898.

Company: Albert B. Fall, captain; Charles G. Cruickshank, first lieutenant; Neill Edwards Bailey, second lieutenant. Mustered in July 18, 1898.

Of the personnel of the officers and men in the two New Mexico volunteer battalions, it is but just to say that in physique, in drill, discipline, and all soldierly qualities they are not surpassed by any soldiers in the United States Volunteer Army. In the few opportunities they have had to face the enemy they have shown wonderful courage and fortitude and conducted themselves like veterans.

Of the 29 commissioned officers in the two battalions, 14 were at the commencement of the war active officers of the National Guard, and several others had at one time belonged to that organization.

Owing to the fact that a number of the National Guard organizations have been left without commissioned officers, and for that reason are in a manner disorganized, I am unable to obtain reports as to the number of men from the National Guard who have enlisted in the United States volunteer service. Company G, stationed at Albuquerque; Company I, stationed at Las Vegas, of the First Infantry Regiment, and Troop E of the First Cavalry, stationed at Santa Fe, have practically disappeared, both as to officers and men. This is also true in a measure as to the enlisted men of Troop C of the First Cavalry, stationed at Aztec; and all of the organizations have contributed more or less officers and men to the grand cause. I think it is safe to say,

that of about 1,100 officers and men from New Mexico (about 200 enlisting in other States and in the Regular Army) in the present war, at least one-half were National Guard members.

In view of the uncertainty that exists as to how long the war may continue, and knowing that a third call for volunteers would have the effect to again disorganize, it has been thought expedient not to attempt a reorganization of the National Guard until the war shall be over.

Very respectfully,

WILLIAM H. WHITEMAN,
Adjutant-General.

Hon. MIGUEL A. OTERO,
Governor of New Mexico.

NEW MEXICO'S WAR RECORD.

Since New Mexico became a part of the United States by the formation of her Territorial government, she has never failed to give a prompt response to the nation's call for soldiers. The loyalty and patriotism of the people of New Mexico can not be successfully questioned in view of her war record.

THE INDIAN WAR.

In the early history of the Territory the frequent Indian outbreaks were a source of great danger and distress in the West. New Mexico had her full share of suffering from this cause.

The large number of Indian depredation claims now in progress of adjudication by the Government affords some idea of the destruction of property by the Indians, but numerous graves, to be found in all parts of the Territory, testify to the loss of human lives and the valor of her native people. Happily those days of death and destruction are gone, and gone forever, by reason of the wise and humane policy of our Government towards the Indians.

In those early wars New Mexico rendered material assistance to the Government by organizing and equipping her militia and sending them into the field, where they rendered valuable services in subduing those savage tribes. Several thousands of the citizens of the Territory served as soldiers during those Indian wars, but I regret that, owing to primitive methods of keeping records in those early days, it is impossible for me to give an accurate list either of those engaged or of those who fell in those wars.

THE CIVIL WAR.

In the war between the States, commonly called the war of the rebellion, New Mexico responded promptly, and, according to the records, sent into the field in defense of the Union 6,561 soldiers, a large majority of whom were natives. Four thousand four hundred and thirty-two of these were enlisted for three years; they were engaged at Valverde, Glorieta Mountains, San Augustine, Peralta, and other battles, and 277 of them were killed in battle or died from wounds and other causes.

Many citizens of New Mexico entered the Union Army in other regiments and at other places, so that the records do not show the entire number of soldiers furnished by the Territory. I fully believe, from investigation, that New Mexico furnished about 9,500 soldiers to the Union Army during the civil war, or about 10 per cent of the entire population of the Territory, and none at all to the Confederate army, so far as I am able to ascertain.

THE SPANISH-AMERICAN WAR.

When war was declared between the United States and Spain New Mexico was alive with enthusiasm. A telegram from the War Depart-

ment, authorizing the enlistment of a squadron, or four troops, of cavalry for the First United States Volunteer Cavalry, was received by me on the 25th day of April last, and on the 6th day of May following the entire number was mustered in in accordance with the call, and they left Santa Fe on the following day, May 7, for the concentration camp at San Antonio, Tex. Later, a call was received for 100 more men from New Mexico for the same regiment, and they were recruited, mustered in, and went to the front within ten days after the call was received.

For this regiment, now familiarly known as "Roosevelt's Rough Riders," New Mexico furnished about 500 officers and men. A large majority of these were young men, many of them being under the age of 21 years, and were recruited from all the walks of life. Among them were many college students, business men, clerks, ranchmen, cowboys, and miners. Most of them were accustomed to the saddle and capable of being ideal cavalry soldiers. These men, with their regiment, participated in the battle of Las Guasimas and the daring charge and capture of San Juan Hill near Santiago de Cuba, and their deeds of valor, now known to the nation and the civilized world, will in future form one of the brightest pages in our military history.

Of this regiment Col. Theodore Roosevelt has kindly said, in a letter addressed to me—

SANTIAGO DE CUBA, July 25, 1898.

MY DEAR GOVERNOR: I write you a line just to tell you how admirably the New Mexico troopers in the battalion of the Rough Riders which I have commanded before Santiago have behaved. Three of the eight troops with me were from New Mexico, being commanded by Captains Muller, Luna, and Llewellyn. All three captains and all three troops distinguished themselves. As for the troopers themselves, I can not say too much for their daring and resolution in battle, their patient endurance of every kind of hardship and labor, and their discipline, ready obedience, and order in camp, these last qualities being as indispensable to soldiers as courage itself. I am more than proud to be in the same regiment with them. I can imagine no greater honor than to have commanded such men.

Among the promotions which it gave me peculiar satisfaction to recommend were those of Sergeant Dame, to be lieutenant, and of Lieutenant Keyes, to be adjutant.

Captains Muller, Llewellyn, and Luna have all three shown such gallantry and efficiency that it would be difficult to distinguish between any two of them. Captain Muller and Captain Llewellyn were under my immediate eyes in both fights. In the charge on the first hill in the Santiago fight they were with me, and their two guidons, with that of Captain Luna, were planted on the hill before any others, and almost at the same moment. In both fights Captain Luna was, as it happened, also under my immediate eye, and I was more than pleased at the fearlessness with which he led his men into the hottest fire. All three met instantly every demand I made on their courage and capacity, and I made very many, for we have had hard fighting.

I only wish I could get my remaining troops, and lead them all in the Porto Rico expedition.

With great regard, I am very sincerely yours,

THEODORE ROOSEVELT,
Colonel First United States Volunteer Cavalry.

Hon. MIGUEL A. OTERO.

Still another call was received from the War Department for four companies of infantry, to form a part, or one battalion, of a regiment called the Arizona-New Mexico-Oklahoma-Indian Territory United States Volunteer Infantry. Within a very few days after this call was received the 15 officers and 424 noncommissioned officers and privates left New Mexico for Whipple Barracks, Ariz. These four companies were recruited at four of the principal cities of the Territory—Santa Fe, Las Vegas, Albuquerque, and Las Cruces. Men from all parts of the Territory enlisted in them, and these soldiers were composed of robust and

enthusiastic young men who are creditable alike to the Territory and the nation.

More men responded under each call than were required to fill our quota, and, in their eagerness to serve their country, it is estimated that 150 enlisted in the Regular Army and in regiments from the States, and some of whom are now with the army in the Philippine Islands.

Thus New Mexico has furnished 1,089 soldiers for the late war, and would and could have furnished many more had the opportunity been afforded us.

STATEHOOD.

I would most earnestly renew my recommendation made in my last report with reference to the early admission of New Mexico as a State of the Union; the reasons given at that time for such admission are stronger now by reason of increased population, wealth and intelligence.

Under the treaty of peace concluded between the United States and Mexico, February 2, 1848, known as the "Treaty of Guadalupe-Hidalgo," it was provided that "the territory acquired by the Mexican war and under that treaty should be incorporated in the union of the United States, and be admitted at the proper time (to be judged of by the Congress of the United States) to the enjoyment of all the rights of citizens of the United States according to the principles of the Constitution."

Since that time, California and Colorado have been admitted, and New Mexico and Arizona (which was formerly a county of this Territory) have been refused that privilege, and, I might say, right. For fifty years the Territory, through its legislature and by the recommendations of its governors, has been asking for this recognition guaranteed by solemn stipulations. As long ago as 1850 New Mexico adopted a State constitution and elected a governor and two United States Senators, and its admission was only prevented by the adoption of the celebrated "compromise measures of that year." Twenty years afterwards it held a constitutional convention which formulated a most admirable constitution. In 1876 a bill to admit it to statehood, together with Colorado, passed both Houses of Congress, and only failed to become a law by nonconcurrence in an amendment to that bill. Again, in 1889, there was a constitutional convention, lasting nearly a month, composed of men of the highest character and ability, and their labors resulted in the presentation of a constitution which I have no hesitation in saying was the best formulated in the United States. Copies were laid before both Houses of Congress, and several bills were introduced for its admission; and since that time, each session of Congress has seen bills introduced by members of both political parties for the admission of New Mexico as a State, which have so far failed, and for which failure no good reason has been given. Another bill for this purpose will be introduced at the coming session of Congress, and I urge its earnest consideration in behalf of the quarter of a million people of this Territory.

The organization of civil government in the Territory of New Mexico was unique. The organic act establishing the Territory was approved September 30, 1850; the ratification of the treaty of peace between the United States and Mexico was had May 30, 1848, and proclamation thereof made July 4, 1848, just fifty years earlier than the capture of Santiago. But two years prior to that time the United States Government had established through its military authority a complete code of civil laws for the future Territory of New Mexico, which at that time consisted of the present Territory, all of Arizona, and the southern half

of Colorado. On the 22d day of September, 1846, Brig. Gen. S. W. Kearny, in command of the army of invasion, issued and proclaimed to the people a "bill of rights," which is still retained on the statute unchanged. On the same day he proclaimed "the Kearny Code," which was reenacted by the legislature in 1865 and nearly all the provisions of which are still in force; and on the same day, by virtue of his authority as brigadier-general, he appointed the following list of civil officers: Charles Bent, to be governor; Donaciano Vigil, to be secretary; Richard Dallam, to be marshal; Frank P. Blair, to be United States district attorney; Charles Blumner, to be treasurer; Eugene Seitzendorfer, to be auditor of public accounts, and Joab Houghton, Antonio José Otero, and Charles Beaubian to be judges of the superior court. In his letter transmitting to the Adjutant-General a copy of these laws and list of appointments, General Kearny made the following statement:

I take great pleasure in stating that I am entirely indebted for these laws to Col. A. W. Doniphan, of the First Regiment of Missouri Mounted Volunteers, who received much assistance from private Willard P. Hall, of his regiment. These laws are taken, part from the laws of Mexico, retained as in the original, a part with such modifications as our laws and Constitution made necessary; a part are from the laws of the Missouri Territory, a part from the laws of Texas, and also of Texas and Coahuila; a part from the statutes of Missouri, and the remainder from the Livingstone Code.

The first governor, Bent, was assassinated, the year after his appointment, at the pueblo of Taos, during what is known as the "Taos rebellion," which was suppressed with considerable loss of life by United States troops, out of which rebellion arose a number of prosecutions for treason, conducted by Frank P. Blair, United States attorney.

The civil law and the Kearny code remained the rules of civil action down to 1876, when, by statute, the "common law as recognized in the United States of America" was adopted. This was the law of the land until the legislature of 1897 adopted a "Code of civil procedure."

The first legislative assembly of the Territory of New Mexico assembled in Santa Fe in December, 1847. The laws passed at that session were printed in a pamphlet, to which was added "Order No. 10" from the Headquarters of the Ninth Military Department, imposing a duty of 6 per centum on merchandise imported into the Territory. The authorization of these laws is printed in the same pamphlet, as follows:

SPECIAL ORDER }	HEADQUARTERS NINTH MILITARY DEPARTMENT,
No. 5. }	Santa Fe, N. Mex., February 5, 1848.

The foregoing legislative enactments of the Territory of New Mexico, having been duly reviewed by the commanding general of the Territory, they are hereby approved and they will be duly observed.

By order of brigadier-general,

STERLING PRICE.

W. E. PRINCE,
Aide-de-Camp and Acting Assistant Adjutant-General.

The first section of the General Orders No. 10, referred to on the title page of the laws, is as follows:

On and after the first day of February, 1848, the following regulations will govern the civil and military officers in the discharge of their respective duties: First, the officers named in the statutes as secretary of Territory, United States district attorney, and United States marshal are hereby abolished.

It is believed the above résumé of the methods of introducing American laws into conquered Spanish territory may be of interest at this time when similar conditions exist which may require similar action on the part of the Government,

"THE ADOBE PALACE."

The old residence of the governors-general under Spanish and Mexican rule, known as the "Palace," which for more than three hundred years has been the headquarters of the governors, captains-general, and chief executives of the Territory, province, or kingdom, is now in an admirable state of preservation, owing to the liberal appropriations made by the Government in the past. I regret to say, however, that unless the General Government continues to look after this historic old building, as it has in the past, it will soon go to ruin and decay.

It is at present occupied in the west end by the post-office; in the center as the residence and office of the Territorial secretary, and in the east end by the governor for his office, and the historical society of the Territory. This last institution has stored therein many rare and curious images and other works of prehistoric races found in the Territory, as well as ancient arms, armor, and articles of household use.

In an act passed by the last Congress, donating lands to the public schools and institutions of the Territory, approved June 21, 1898, by inadvertence a clause was inserted, being the last three lines of section 6 of the act, donating this historic old building to the Territory, as follows:

The building known as the "Palace" in the city of Santa Fe, and all lands and appurtenances connected therewith and set apart and used therewith, are hereby granted to the Territory of New Mexico.

This clause does not meet with the approbation of our citizens, who believe that, so long, at least, as we are a Territory, this palace should remain under the fostering care and protection of the General Government.

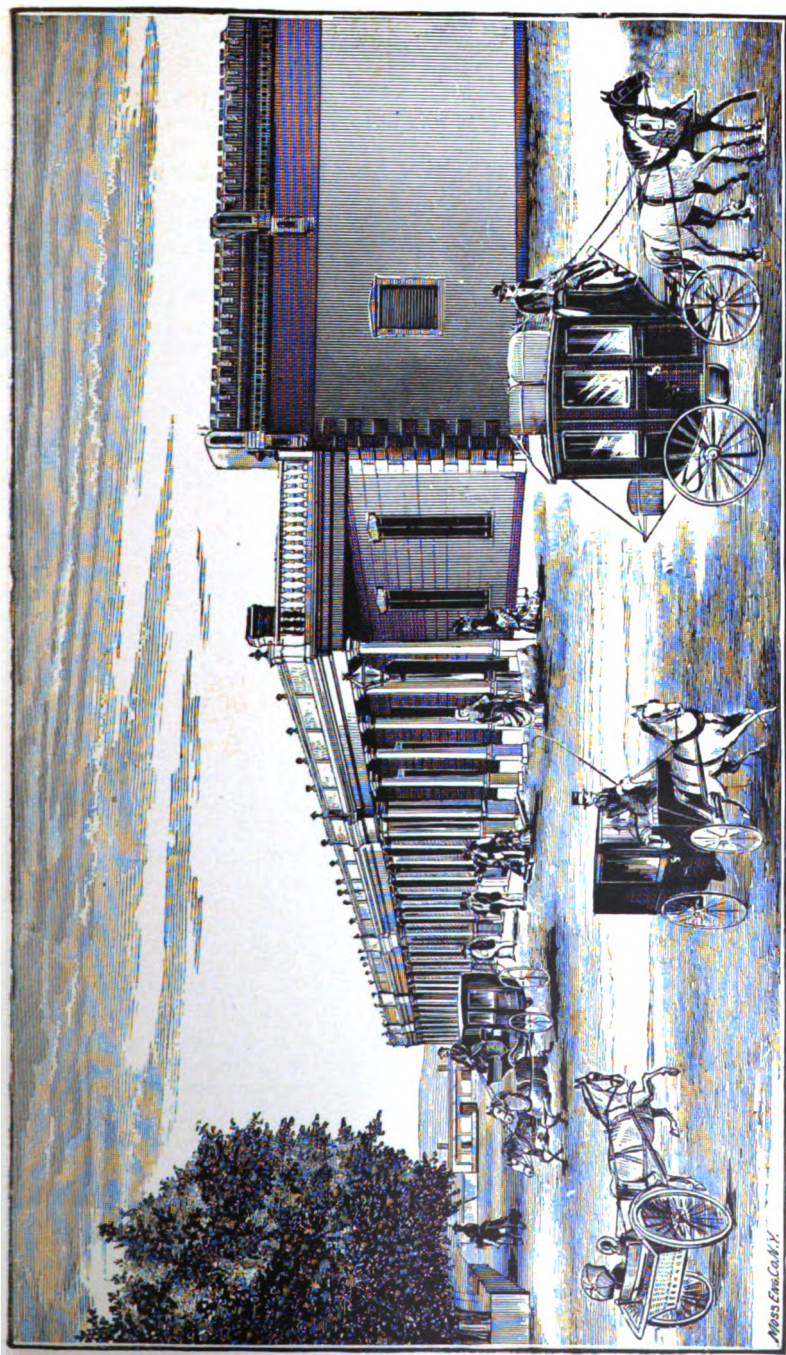
The Territory is not financially able to take proper care of and preserve this building as should be done, as it requires all the revenue possible to maintain its own public buildings and institutions which are necessary to the proper conduct of its government. In addition our people feel that the United States owning and caring for this building puts it in closer touch with all of our citizens, and accordingly, I most earnestly recommend that such clause of section 6 of the act above referred to be repealed.

While the new capitol building, now nearing completion, will have offices for the governor and secretary, yet they are so distant from the business part of the city, it will be inconvenient for these officers to use them except during the session of the legislature, which meets only once in two years and sits for sixty days, and during the remainder of the two years these officers should be in a more convenient locality, such as is afforded by the old "Palace," and it is only proper that the Government itself should furnish these officials with offices, the same as it does other United States officials.

The post-office is also located in this building, most conveniently for the accommodation of the public, and, of course, without any expense for rent.

The building is now badly in need of repair, and will of course suffer greatly on account of not getting the appropriation asked for last year by the Territorial secretary and custodian.

I trust that my recommendation will be carried out, and that the necessary appropriation will be made by Congress, as asked by the secretary, and attached hereto, in order that the necessary work be commenced at as early a day as possible,



ADOBE PALACE, SEAT OF GOVERNMENT 300 YEARS AGO AT SANTA FE.

In this connection, showing the historical association connected with this old building, I desire to quote from the report of my predecessor, Hon. L. Bradford Prince, made in 1890. The accuracy of the statements here made, can not be doubted, as ex-Governor Prince has made a study of New Mexico and has written a history of the Territory which is recognized as an authority.

Ex-Governor Prince in his report says:

Without disparaging the importance of any of the cherished historical localities of the East, it may be truthfully said that this ancient palace surpasses in historic interest and value any other place or object in the United States. It antedates the settlement of Jamestown by nine years, and that of Plymouth by twenty-two, and has stood during the two hundred and ninety-two years since its erection, not as a cold rock or monument, with no claim upon the interest of humanity except the bare fact of its continued existence, but as the living center of everything of historic importance in the Southwest. Through all that long period, whether under Spanish, Pueblo, Mexican, or American control, it has been the seat of power and authority. Whether the ruler was called viceroy, captain-general, political chief, department commander, or governor, and whether he presided over a kingdom, a province, a department, or a Territory, this has been his official residence.

From here Oñate started in 1599 on his adventurous expedition to the Eastern plains; here, seven years later, 800 Indians came from far off Quivira to ask aid in their war with the Axtaos; from here, in 1618, Vincente de Salivar set forth to the Moqui country, only to be turned back by rumors of the giants to be encountered; and from here Peñalosa and his brilliant troop started on the 6th of March, 1662, on their marvelous expedition to the Missouri; in one of its strong rooms the commissary-general of the Inquisition was imprisoned a few years later by the same Peñalosa; within its walls, fortified as for a siege, the bravest of the Spaniards were massed in the revolution of 1680; here, on the 19th of August of that year, was given the order to execute 47 Pueblo prisoners in the plaza which faces the building; here, but a day later, was the sad war council held which determined on the evacuation of the city; here was the scene of triumph of the Pueblo chieftains as they ordered the destruction of the Spanish archives and the church ornaments in one grand conflagration; here De Vargas, on September 14, 1692, after the eleven hours combat of the preceding day, gave thanks to the Virgin Mary, to whose aid he attributed his triumphant capture of the city; here, more than a century later, on March 3, 1807, Lieutenant Pike was brought before Governor Alencaster as an invader of Spanish soil; here, in 1822, the Mexican standard, with its eagle and cactus, was raised in token that New Mexico was no longer a dependency of Spain; from here, on the 6th of August, 1837, Governor Perez started to subdue the insurrection in the north, only to return two days later and to meet his death on the 9th near Agua Prieta; here, on the succeeding day, Jose Gonzales, a Pueblo Indian of Taos, was installed as governor of New Mexico, soon after to be executed by order of Armijo; here, in the principal reception room, on August 12, 1846, Captain Cooke, the American envoy, was received by Governor Armijo and sent back with a message of defiance; and here, five days later, General Kearny formally took possession of the city, and slept, after his long and weary march, on the carpeted earthen floor of the palace.

From every point of view it is the most important historical building in the country, and its ultimate use should be as the home of the wonderfully varied collections of antiquities which New Mexico will furnish.

Coming down to more modern times, it may be added that here General Lew. Wallace wrote Ben Hur, while governor, in 1879 and 1880.

TERRITORY OF NEW MEXICO,
OFFICE OF THE SECRETARY AND CUSTODIAN ADOBE PALACE,
Santa Fe, October 3, 1898.

YOUR EXCELLENCY: I had the honor on the 10th day of September, 1897, to submit for your consideration and approval, to be forwarded to the honorable Secretary of the Interior, a statement of the then condition and needs of the Adobe Palace in this city.

In section 6 of an act of Congress approved June 21, 1898, the Adobe Palace and the grounds in connection therewith were ceded to the Territory of New Mexico. This historical building has often been brought to the attention of Congress in petitions for its preservation, and its transfer came as a surprise to the whole Territory. It is almost the last remaining link between the very earliest days of Spanish occupation more than three hundred years ago and the present.

The building is a Mecca for all tourists to New Mexico and the southwest, both native and foreign, and, as custodian, I have to report visitors almost every day in the past fifteen months, sometimes numbering as many as forty at one time.

The transfer of this building to the Territory, under the provisions of the act, means its early and sure destruction, for under the act any income derived from the building must go to the school fund, and the Territory could not and would not preserve it. Placed as it is upon the public plaza, as in Spanish and Mexican countries is always done, I feel confident there would be a constant struggle by individuals for occupancy of it, and there would be no income derived for the school fund.

Upon the request of very many of the most public spirited, respectable, and intelligent of our citizens, within and without the city of Santa Fe, I would most earnestly urge the repeal of that portion of section 6 in the said act referring to the Adobe Palace in Santa Fe.

And in this connection it is proper to call attention to the estimates submitted last year for the purpose of putting the Adobe Palace in complete and substantial repair, a copy of which is forwarded herewith. The need is greater to-day than a year ago.

I am, very respectfully, yours,

GEO. H. WALLACE,

Secretary of New Mexico and Custodian of the Adobe Palace.

Hon. MIGUEL A. OTERO,

Governor of New Mexico, Santa Fe.

TERRITORY OF NEW MEXICO,
OFFICE OF THE SECRETARY AND CUSTODIAN OF THE ADOBE PALACE,
Santa Fe, September 10, 1897.

SIR: In reply to your request for a statement as to the condition and needs of the Adobe Palace, I have the honor to submit the following:

The amount (\$2,000, expended by my predecessor during the last fiscal year for new roof, repairs to the post-office room, etc., left much to be done to place the building in thorough repair and preserve it from the weather. The wooden sidewalk is nearly worn out and must be replaced. It will be better for the building, and comply with the request of the city, if this should be made of cement with a stone curbing. About 150 feet of the portal is falling from decay, and must be replaced. This was not roofed last year, for this reason. The ceilings of the entire building have been of canvas, but now that there is a steel roof, economy and health demand the substitution of plaster in place of the constantly falling cloth, so easily destroyed and calling for repair. The floors are scarcely any two on the same level, and being of soft pine are very much worn and in some places patched to the limit of possibility.

A thorough coat of paint, outside and in, and calsomining for the walls are badly needed, in addition to a plaster repair of the outside and inside walls.

The plumbing needs overhauling, and, as the supply of water is now entirely from the city system, should be extended to the resident portion of the Palace.

The following is submitted as an estimate of the amount necessary by the above conditions, and for the proper protection of the building, and to make it comfortable for occupancy:

Ceiling and floors.....	\$2, 000. 00
Cement sidewalk	1, 000. 00
Painting and calsomining.....	500. 00
Portal and roof	1, 000. 00
Plumbing.....	500. 00
Incidental repairs.....	1, 000. 00
Total	6, 000. 00

Very obediently yours,

GEO. H. WALLACE,

Secretary of New Mexico and Custodian of the Adobe Palace.

Hon. MIGUEL A. OTERO,

Governor of New Mexico.

DONATION OF SCHOOL LANDS.

By the act approved June 21, 1898, donations of land were made to the various Territorial institutions and the public schools of the Territory, amounting in the aggregate to about 5,000,000 acres; this being done in anticipation of our becoming a State, and for the purpose of aiding the Territory in the education of its people, and there was

appropriated by section II of that act \$10,000, to be expended "under the direction of the Secretary of the Interior for the purpose of bearing the expenses of the selection and segregation of said respective bodies of land, including such compensation to said commission that the Secretary of the Interior may deem proper."

The Secretary of the Interior has decided that no portion of this amount can be used for paying the fees of the local land officers for the entry of these lands, and the Territory has absolutely no funds which it can draw upon for the purpose of making these payments, which are necessary under the ruling of the Secretary of the Interior; nor can it procure the same, as our bonded debt is now beyond the limit fixed by the act of Congress, and the rate of direct taxation necessary for the carrying on of the affairs of the Territory and paying interest is now all that the people can bear. It is estimated that the amount of fees to be paid to the local land officers will amount to about \$25,000, which will have to be in hand or available before the generous donation by Congress can be of service to the Territory.

While this grant is very large in area, it must be remembered that probably 90 per cent of the lands which could be selected is practically a desert, and of no value for sale or leasing purposes. The provisions in section 10 of the act limiting the area of land to be leased to any one person or corporation, to one section of 640 acres, will prove a great detriment to carrying out the intent of the act; while such a provision is a wise protection in an agricultural country, it is in such a country as we have here almost prohibitive, in that these leases must be made almost invariably to cattle or sheep men, who require large areas of the sort of land we have for the grazing of their animals. I would therefore recommend that this act be amended so that there may be no limit upon the area that may be leased, except for agricultural or timber land, and that an appropriation of at least \$25,000 be made for the purpose of paying the land office fees for the listing and segregation of such lands. I, in another part of my report, have recommended the repeal of the last portion of section 6 of said act donating the "Old Palace" to the Territory of New Mexico, giving my reasons therefor.

APPROPRIATIONS.

The salary of the governor is fixed by statute (May 1, 1876, R. S. U. S., sec. 1845) at \$3,500 per annum, but for many years—indeed, since the act was passed—there has only been an appropriation to pay this salary of \$2,600, and it has been determined in the Supreme Court of the United States, in a case taken from the Court of Claims, that the acceptance by the officer of the amount of the appropriation was a bar to his receiving anything more.

The same is true of the secretary of the Territory, his salary, as fixed by statute (same section), being \$2,500 per annum, and the appropriation being \$1,800.

While these amounts might have been sufficient at the time the act was passed, twenty-two years ago, the duties and responsibilities of both offices have increased to a wonderful extent by reason of the increase in population, the construction of railroads, and general business enterprises. The actual work occupies all the time during business hours, and constantly encroaches far into the night, besides necessitating frequent journeys from one part of the Territory to another on official business.

In addition, there is no provision of law for a private secretary or clerk to the governor, while his official correspondence alone is enor-

mous, and he is obliged to employ a private secretary for only a part of the time, and settle for the same out of other resources, not being able to give constant employment, which should be done in the interest of public business.

The secretary of the Territory is allowed a clerk, with an appropriation of \$1,200 per annum to pay the same. I would therefore recommend most strongly that the governor be allowed a private secretary by the Government, at a salary of \$1,200 per annum, and that an appropriation be made accordingly.

I would also earnestly recommend that the full compensation provided by law to the governor and secretary be included in an appropriation to that amount.

By the Territorial laws the governor is made ex officio a member of nearly all of the boards of regents and directors of the different Territorial institutions, and of necessity meets with them in different portions of the Territory when occasion presents. This of itself involves a considerable outlay of traveling expenses, for which the present appropriation of \$500 is totally inadequate, as out of this amount has to be paid fuel, lights, stationery, telegrams, janitor service, office furnishings, etc., and, as the office is constantly running behind, I would recommend an increase for contingent expenses of the governor's office.

The five judges of the Territory of New Mexico, consisting of the chief justice of the supreme court, with four associate justices, are allowed \$3,000 per annum only. The work is so heavy that they are actually holding either district or supreme court for the hearing and trial of cases eleven months in each year; and under our Territorial law the courts are open at all times for the transaction of any business not involving an actual trial by jury, so that the chambers work is very heavy. In the Indian Territory there are four judges, at an annual compensation of \$5,000; Oklahoma has five judges, with a salary of \$3,000 each. The population of New Mexico, while not as large, is nearly equal to that of the two above-named Territories, while its area is double that of the two Territories named.

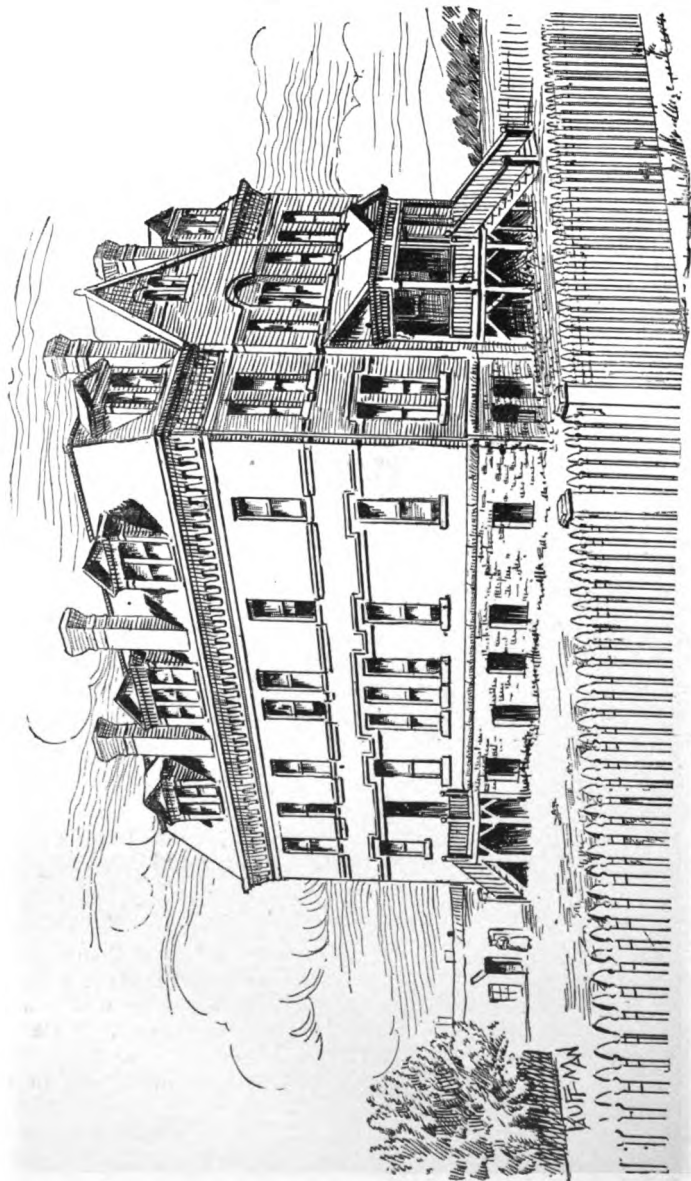
The compensation of these judges was also fixed on the 1st of May, 1876, when there were no railroads in the country, less than one-third of our present population, with no communication with the outside world except by wagon, and it is altogether too inadequate a compensation for the responsibility and labor involved.

I would therefore earnestly recommend that the compensation of each of the judges of the supreme court be increased to \$5,000 per annum.

HOW TO OBTAIN TITLE TO PUBLIC LANDS.

The following information is furnished by the register of the United States land office at Santa Fe, N. Mex.:

There are about 57,000,000 acres of unappropriated public land in the Territory of New Mexico. Agricultural public land is subject to entry only under the homestead and desert-land laws. The homestead laws of the United States secure to qualified persons the right to settle upon, enter, and acquire title to not exceeding 160 acres of public land, by establishing and maintaining residence thereon and improving and cultivating the same for the continuous period of five years. A homestead entryman must be the head of a family, or a person who has arrived at the age of 21 years, and a citizen of the United States, or one who has declared his intention of becoming such, and he must not be the owner of more than 160 acres of land in any State or Territory. A wife who has been divorced from her husband, or deserted by him, can make



PRESBYTERIAN MISSION SCHOOL, SANTA FÉ.

homestead entry. Payment of \$16 fees and commissions must be made at the time of making entry, and final proof can be made at any time when five years' residence thereon and a cultivation of a portion of the land can be shown. The cost of making final proof, including publication of notice, taking testimony, and commissions, is from \$14.25 to \$15. A party can, at the time of making homestead entry of 160 acres, enter 160 acres under the desert-land act. He will be required to pay 25 cents per acre at the time of making the entry, after which he is required to expend at least \$3 per acre (\$1 per acre each year for three years) in labor or money in improving the land and constructing reservoirs, canals, and ditches for irrigating and reclaiming the tracts entered; and the party may make final entry at any time prior to the expiration of four years, on making the required proof of reclamation, of expenditure to the aggregate amount of \$3 per acre, and of the cultivation of one-eighth of the land and making a final payment of \$1 per acre.

New Mexico lies between the thirty-first and thirty-seventh parallels of latitude. The southern portion of the Territory has an elevation of 3,500 feet, and from that the height above sea level ranges to 12,000 feet in the mountain ranges; and on account of this elevation most any part of New Mexico is found to be delightfully cool and pleasant throughout the summer. The air is wonderfully pure and bracing, and the sunshine, "the glory of New Mexico," brings health and strength to the invalid, many of whom come here suffering mostly from tuberculosis and who derive a wonderful benefit from this climate, often permanent cures being made.

People visiting New Mexico learn many interesting points in the history of this country; they learn to love the wilderness of the lofty and picturesque Rockies—the Italian or "turquoise-tinted skies," as a western writer described them. The beauties of scenery and sunset, never before realized, will make a lasting impression in favor of our beautiful Territory.

SOCIAL CONDITIONS.

The cities and towns of our Territory are filled with cultured, companionable people, ever ready to entertain and look out for the welfare of the stranger within its gates. The hotels are equal to any of the Eastern summer resorts, and life is as attractive here as anywhere else in the world. In most of the towns throughout New Mexico the plaza forms the center of the town. In this plaza concerts are given regularly by the local bands, which are enjoyed alike by the resident and the stranger.

PREHISTORIC TIMES.

Long before Columbus set foot on the shores of the New World the valleys and plains of New Mexico were the seat of a civilization which has been the wonder of scientists and explorers; for ages unknown people contended for the possession of the lands and streams. Nation after nation of strange beings followed each other in conquest, and to-day evidences are to be found in the ancient settlements of their unknown inhabitants.

The homes of the cliff dwellers still stand, and the old pueblos are the homes of the descendants of the builders, and the antiquarian will find enough of that which is old beyond tradition, yet new to the nineteenth century, to keep him occupied during years of patient research. It is not necessary to go to Egypt or Persia to find ruins and relics of people who have passed from the face of the earth; they can be found in New Mexico, and within easy reach of comfortable homes and hotels.

CLIMATIC.

There is no portion of the Union possessing such splendid climatic conditions as exist in this Territory. Here we have a dry, arid temperature, with no extremes of heat or cold, with clear, bright skies and an almost continuous sunshine, that has given New Mexico the well-known sobriquet of "the Sunshine State."

The climate is peculiarly adapted to the cure of pulmonary diseases. A celebrated physician who has given much study to the subject, and who recently made a tour of Europe and America in the interest of this class of the afflicted, investigating the climatic conditions of the various countries with reference thereto, recently stated that the conditions existing in New Mexico were superior to those found elsewhere; that it was an ideal climate for the cure of pulmonary diseases. This is conceded by the best-informed medical experts.

It is probable that at this time there is no disease that afflicts so large a class of humanity with such fatal results as that of pulmonary consumption; none that causes so much suffering, pain, and sorrow. It is a scourge affecting every class, the rich and the poor, the high and the low—all fall beneath its blight and succumb to its dreadful ravages.

Medicinal science has never been able to master it or to discover medical appliances or remedies that will cure it when once it has a firm hold upon its victim. The greatest minds of the profession have devoted their lives to its study, searching for remedies without avail. All agree that nature's remedy is the best and only cure. Breathing of a pure, invigorating, rarefied atmosphere in an equable climate, with clear, bright sunshine, where the heat of the sun is at its maximum and that of the air at its minimum, are the best conditions for its cure.

All of these conditions are found at their best in New Mexico. In every community may be encountered those who have taken advantage of these life-giving qualities. In a large majority of cases where the invalid has come in the early stages of the disease he has found relief, and either been entirely cured or had many years added to his life.

NEW MEXICO SOIL.*

The soils of New Mexico, as a rule, are quite different from the soils of the Eastern States, and possess many advantages not possessed by the latter.

The power of the soils to produce plants depends upon many conditions, among the more important of which may be mentioned a proper control of the moisture, the climate, and the amount of available plant food present.

In regard to moisture control, soils depending on irrigation for their moisture, as do those of New Mexico, have a decided advantage over soils depending solely upon rainfall. While the valleys of New Mexico have an average annual rainfall of probably some 10 or 12 inches, and the greater part of this usually comes in the summer during the growing season, it is still quite insufficient for the needs of ordinary farm crops which must depend for the greater part of their moisture upon irrigation. The supply of moisture to irrigated soils is under almost absolutely perfect control, provided the water supply is constant. The advantages of such a control of the moisture must be apparent to anyone.

* Arthur Goss, chemist, New Mexico Agricultural Experiment Station.



FEDERAL BUILDING, SANTA FÉ.

MONEY IN IRRIGATION.

The improved systems of irrigation upon which New Mexico has to depend for the multiplication of her useful land area are developing rapidly, but there are still many opportunities for the investment of capital in irrigation projects, which can not fail, under good management, to make millionaires of the projectors.

There is in operation the Springer system of irrigation, with 50 miles of ditches and five reservoirs, covering 22,000 acres. The Vermejo system, which controls 57 miles of ditches and ten reservoirs, supplies 30,000 acres. In the northwestern portion of the Territory there are 200 miles of ditches, watering 24,000 acres. There are several tracts of fertile soil accessible to streams, which will afford an ample supply, awaiting the attention of moneyed men. Also extensive ditch systems are in operation in the Mimbres region of Grant County.

The irrigation projects noted above are in the four corners of the Territory. In the meantime the great central portions are receiving attention, more than fifty companies having been organized for irrigation projects, and several having plants in operation, affording to the home seeker at the present time ample opportunity for settlement and reclamation.

The valley of the Rio Grande presents the most extensive field for operations of this kind, as the present narrow strip of lands cultivated can be widened very materially by the proper disposition of the water which flows so abundantly from the north and is now allowed to be wasted. A very few years will find all the water now suffered uselessly to run away utilized to the highest degree and enlarging the area of the agricultural and horticultural land to an extent almost fabulous.

Meanwhile individual enterprise is increasing the local supplies by the erection of multitudes of windmills, pumping from artesian wells in various parts of the Territory. To the settler this means much, and will add in a great measure to the future possibilities of production.

THE COMMISSION OF IRRIGATION AND WATER RIGHTS OF NEW MEXICO,
Albuquerque, N. Mex., September 30, 1898.

SIR: Replying to your favor of the 20th instant, requesting the report of the commission of irrigation and water rights for your annual report to the honorable Secretary of the Interior, I desire to say that the work of the commission, as a whole, is incomplete; but I submit herewith the report of Mr. P. E. Harroun, C. E., who has been retained as engineer by the commission.

The report is valuable on account of its accuracy and detailed description covering the Territory, its broad range of technical information on the question of irrigation and water supply, and from the fact that the Territory has never before attempted to compile the data contained in this report.

In justice to your commission I have to say that we could not conclude our work until Mr. Harroun had completed his report, which he has only done yesterday. The secretary tried to secure a meeting of the full commission, but could not secure a single member in the short time in which to answer your request for a report.

The full report of the commission will be in your hands early in December. The final report will include not only this report of Mr. Harroun on irrigation and water supply, but will contain the report of the subcommittee on irrigation law and the conclusions and recommendations of the commission covering the entire subject of irrigation in New Mexico.

I am, very respectfully,

J. E. SAINT, *Secretary.*

Hon. MIGUEL A. OTERO,
Governor of New Mexico, Santa Fe, N. Mex.

THE PRESENT CONDITION OF IRRIGATION AND WATER SUPPLY IN NEW MEXICO.

[A report to the commission of irrigation and water-rights of New Mexico, by P. E. Harroun, civil engineer, Albuquerque, N. Mex.]

To the President and Members of the Commission of Irrigation and Water Rights of New Mexico.

GENTLEMEN: I herewith transmit you my report on the present condition of irrigation and water supply in New Mexico.

Owing to the limited time available for this investigation, it has been found impossible to go into the subject in any other than the most general way, and I have been unable to do more than present to you the bare facts of the case.

Irrigation in New Mexico is wholly confined to the valley of the Rio Grande, the Lower Pecos, and the upper portions of the valleys of streams furnishing a perennial water supply, leaving the vast bodies of arable land between the sources of supply and the trunk streams, unimproved.

This is due to the fact that throughout the Territory there are very few streams whose discharge is sufficient to overcome the great losses due to seepage in the wide sandy bottoms which are characteristic of that portion of their course lying between the trunk streams and their source of supply, and also to the fact that in their upper reaches their channels are generally well confined and of such a character as to admit of diversion by individual or community effort.

Scientific development of the water supply for irrigation has been undertaken in but two sections of the Territory, viz, on the Lower Pecos by the Pecos Irrigation and Improvement Company, and in the upper Canadian district by the Maxwell Land Grant Company, and to-day these are the most wealthy and prosperous sections of New Mexico, thousands of acres being in cultivation where before there was but little or none. The great advantage accruing from such development of the water supply requires no demonstration.

Elsewhere irrigation has been confined to such efforts as the individual and community have been able to make, and with the exception of the San Juan, Taos, and Chama districts has reached a limit beyond which it is impossible to go without adopting modern methods.

The individual and community systems are crude in the extreme, and in order that a proper conception may be had I give a short description of their construction and method of operation, taking for example the series of ten ditches serving the eastern side of the Rio Grande Valley, between San Felipe and Albuquerque, as a typical illustration.

The valley is watered by the Rio Grande, which flows from north to south in a tortuous course, from which the water is taken for irrigation by numerous small canals ranging in capacity from 10 to 30 cubic feet per second. The order of these canals from north to south is the Algodones, Santa Ana, Bernalillo, Sandilla, La Ladera or Alameda, Los Ranchos, Los Griegos de Candelaria, La Verela, Duranes, and Albuquerque, of which the Santa Ana and Sandilla are controlled entirely by the Indians of these pueblos, but differ in no respect from those constructed by the Mexicans. The heads of these canals are of two varieties—open cuts in the bank and diverting dams of brush. Of the former class are the Santa Ana, Sandilla, Los Ranchos, Los Griegos, and La Verela, having no headworks of any description. A cut is simply made in a bend of the river bank, against which the river impinges, and water is drawn off. The other ditches have diverting dams of brush directing the current into the ditch. These dams are constructed by driving cottonwood or willow stakes into the sandy bottom of the river and placing fascines of brush between them, which are weighted down by heavy boulders, while sods are distributed along the upper face.

These dams are not tight, much of the water finding its way through the body of the dam, but they serve to deflect the current toward the head of the ditch and raise the water level from 0.4 to 1 foot. There is one other method of taking water from the river, as shown in the Algodones ditch. The head of this ditch occurs at a rapid of the river, about one-fourth mile below the pueblo of San Felipe. About 25 feet from the east bank, and extending downstream parallel thereto, a brush and boulder wing dam is carried a distance of about 800 feet to the head of the rapids. At this point the diversion from the river is made and the ditch proper begins.

There are no regulating gates or sluices whatever. When the river falls it is found necessary to carry the ditch upstream in order to secure water, while upon a rise of the river the water enters the ditch in such volume as to often cause it to break its banks and flood the lands below. It will be seen that the position of the head of these ditches varies with the height of the river, the variation being at times as great as 2 miles. At each flood these diverting dams are washed out and replaced again when the river has fallen.

After leaving the bed these ditches are carried diagonally from the river, as a general thing following the contour of the ground toward the land to be irrigated, the distance varying from one-half to 3 miles. The irrigated lands lie directly under the ditch, the water being taken from small sluice boxes directly onto the land. Properly speaking, there are no laterals, but on each side of every field there usually extends a small ditch carrying from one-half to $1\frac{1}{4}$ cubic feet per second running to the more distant lands, which are rarely more than 1,200 feet. These lateral ditches vary in distance from each other from 100 to 400 feet, but are not permanent and are likely to be changed after each irrigation.

The method of irrigation is wholly that of flooding. When water is needed the sluice boxes are opened and the water is allowed to flow over the land until the irrigator is satisfied. The practice is usually to flood the land to a depth of from 3 to 4 inches over the entire surface.

All the ditches carry a surplus of water, and as a consequence the use of water is excessive. The surplus water from the irrigated fields and the ditches is allowed to find its own way to the river, and the result is that during the irrigation season, from April 1 to November 1, the roads are almost impassable, and nearly as much land laid waste in swamps as is under cultivation.

The bed of the Rio Grande in the upper portion of this valley is generally of a gravelly nature, the underlying strata being of such a character as to prevent excessive seepage, but below Bernalillo the character of the bed changes to an exceedingly treacherous quicksand and the seepage becomes excessive. There has never been any scarcity of water in the valley until a point is reached in the neighborhood of Peralta, when in 1894 for the first time in the memory of the oldest inhabitants, the river went dry near Corrales, and all the ditches from Los Ranchos down were without water.

The amount of land irrigated by these ditches is uncertain, changing from year to year with the caprice of the people, and can not be ascertained with accuracy without a survey. There has never been a survey of the ditches or lands under them, and there are no maps or records of any description in relation thereto. The total amount of land, however, under ditch is approximately 12,000 acres, of which 3,200 acres are under cultivation. Of the balance 1,800 are in swamps and meadow lands from the waste of water of irrigation and the ditches, while the remainder is uncultivated, not from any lack of water or other natural cause, but lack of enterprise, apparently.

It is impossible to estimate the area supplied by each ditch, for lands lying under one ditch and belonging naturally to its system may be irrigated from a higher one. Should a consumer have difficulty with a mayor-domo of his community ditch he may apply to the community of any other ditch for admission, and if they consent, become one of their number, with all the rights and privileges, provided only, that he furnish his quota of the labor assessed, thus making it impossible to determine the land served by each ditch.

Each ditch is owned and controlled by the owners of the land irrigated by it. Each fall an election is held, at which is elected a mayor-domo, who has full control of the ditch for the succeeding season. He assesses the land for the necessary labor to free the ditch from the silt of the preceding year and keep the ditch in repair during the irrigating season; formulates the local regulations; proportions the water to each consumer, and conducts all matters in relation to the ditch.

Before the irrigation season opens he makes a "survey" of the land each owner expects to cultivate, and an assessment of labor is then made accordingly. The assessment made in general is such that he who holds a tract of about 6 acres is required to furnish the labor of one man in cleaning and repairing the entire ditch in the spring, while he who holds 12 acres is required to furnish one man's labor on the ditch as it may be required for the entire season. Tracts of greater or less acreage are proportioned in accordance.

The proportionment of water to consumers by the mayor-domo is entirely arbitrary, although supposed to be based on acreage. No measurements are ever made. The water is simply turned onto the land, and when it is considered by the mayor-domo that the land has received its allotment, turned off again. As all the ditches in this section carry an excess of water this plan has no opponents.

The mayor-domo is also responsible to the consumers in case of damage arising from his negligence in care of the ditch.

In this event a committee is asked for by the injured party, and this committee proceeds to inquire into the facts of the case, and should the mayor-domo be found at fault they assess damages, which the mayor-domo shall pay. The mayor-domo is paid for his services in the superintendence and care of the ditch by each consumer in accordance with the work assessed, the rate usually being 2 castales of corn (about 24 bushels), or its equivalent, for each man sent to the ditch. He also receives water for his lands free.

Such methods can not be otherwise than wasteful of the water supply and detri-

mental to the lands served. The excessive use of water on the upper sections of the streams results in great losses from seepage and evaporation, depriving those along the lower river of the water needed to mature their crops, and causing the formation of marsh and alkali lands.

Investigation shows also that much of the great scarcity of water complained of in the middle and lower Rio Grande valleys is due not to a lack of water in the river, but to a failure of the irrigation system, either from high water carrying away the primitive dams, or to breaks in the ditches, rendering it impossible to operate the system.

In considering the subject in detail I have found it expedient to divide the Territory into districts, each of which will be considered in detail.

SAN JUAN.—DISTRICT NO. 1.

Geographical location : Northwest portion of the Territory, covering San Juan and parts of Rio Arriba and Bernalillo counties. Acreage irrigated, 13,870.

This district comprises the area drained by the Rio San Juan and its tributaries in New Mexico, and occupies the extreme northwestern part of the Territory.

The river enters the Territory just below its junction with the Piedras, a short distance below Arboles, Col., and thence turning toward the west, passes on near the northwest corner.

This stream receives several tributaries of importance in its passage through the Territory, and all of these are from the north, rising in the San Juan and La Plata mountains in Colorado.

The drainage entering from the south is exceedingly small and uncertain and may be entirely neglected in a general consideration.

In 1896 the mean flow of the Rio San Juan during the irrigation season was 580 second-feet at Arboles while the Piedras was delivering a mean flow of 380 second-feet during the same period, making a mean flow for the river at the Colorado line of 960 second-feet.

The flow from the Rio de Los Pinos at its junction with the San Juan is unknown, and but few measurements have been made at any time.

From an examination of the data available, however, it is believed that the mean flow may be safely placed at 80 second-feet.

Las Animas is the largest tributary of the San Juan in New Mexico. Its mean flow at Durango in 1896 was 855 second-feet, and it is probable that this flow reaches the San Juan below Bloomington with but little change, for, although the Rio Florida enters about 12 miles below Durango, its waters are entirely in use during the dry season for irrigation, while its surplus at other times perhaps no more than compensates for losses from seepage and evaporation below.

Rio La Plata enters the San Juan about 3 miles below Farmington. No data is available as to the flow, but it is believed to carry a mean of 50 second-feet.

These streams are all permanent in character, but the flow fluctuates with the season, depending primarily upon the melting of winter snows in spring and upon the so-called rainy season, occurring here usually in the latter part of August and in September.

Spring flow usually begins in the early part of March and reaches a maximum from May 10 to 20, thence gradually declining until the forepart of July, when it reaches the normal summer flow. The rainy-season flow, occurring in August and September, is characterized by sudden freshets which are at times of great volume, as is instanced in September, 1896, when a flow of 7,800 second-feet was observed on the Animas River.

The irrigation system in this district comprises nineteen ditches on Las Animas, eighteen on La Plata, and eighteen on San Juan.

There are also a few small ditches on Rio de Los Pinos, but here the valley is narrow and the fall heavy, every ranch having its own small ditch.

All these ditches are either private or community with the exception of "The Animas, La Plata and San Juan Canal," which has been built for speculation purposes.

There is in actual cultivation under the 19 ditches on Las Animas, 4,480 acres; under the 18 on La Plata, 3,200 acres, under the 18 on San Juan, 3,840 acres, while on Rio de los Pinos some 300 acres (estimated), or a total of 11,820 acres actually under cultivation on these streams.

This acreage could be increased to 25,000 without extension of the present systems.

On the Rio Navajo, in the northeast portion of the district, there are 750 acres actually in cultivation, with a like acreage on the Dulce. This, with 450 acres on Cañon Largo and 100 acres on Cañon Campanero, is the extent of the actual area in cultivation, or 13,870 acres in the entire district. The total land under ditch is in the neighborhood of 50,000 acres, that portion not in actual cultivation being used for pasturage; of this, at least 25,000 acres could be put under cultivation without increase in the present system.



SAN JUAN VEGETABLE BOUQUET.

CHAMA.—DISTRICT No. 2.

Geographical location: Northern portion of the Territory, covering portions of Rio Arriba and Taos counties. Acreage irrigated, 21,700.

This district covers the drainage area of the Rio Chama with all its tributaries. It extends from the Continental Divide on the west to its junction with the Rio Grande on the east; from the Colorado line on the north to the Vallas Mountains on the south, covering in all about 2,400 square miles.

Its surface is greatly broken, being high and mountainous over the greater portion, affording a catchment area which, with the exception of the districts including the Sangre de Cristo Range, is unsurpassed.

The valleys in general are characterized as being narrow, with steep slopes, and shut in from the surrounding country by high, steep walls.

There are, however, several mesas of fine land in the northern and central portions, although they are as yet almost entirely undeveloped.

From the junction of the Chama with the Rio Grande to about 4 miles above Abiquiu the river flows through a broad valley from 1 to 2.5 miles wide and with considerable fall. This valley has been in cultivation for many years and is one of the most fertile sections of the Territory.

Above Abiquiu the river flows through a narrow canyon, there being but few small isolated tracts capable of cultivation until the Park View section is reached, where from La Puente to Los Brazos is one of the best agricultural areas in the district. Above Park View the river is confined to the canyon, affording no irrigable lands between this point and the Colorado line.

The tributaries of the Chama are some fifteen in number, and may be divided into two classes, those which flow through wide, sandy valleys and whose channels are broad near their mouths, thus affording much loss from seepage and evaporation in the lower portions, and those streams which are confined to more permanent channels and whose valleys partake more of the canyon character, thus affording comparatively little loss. Of the first class are all streams below Cebolla, while those above are of the second class.

The Chama is an exceedingly muddy stream, its waters carrying great quantities of silt in suspension. This characteristic is due entirely to the tributaries of the first class mentioned above, the waters of the second class being comparatively clear and free from silt excepting in times of freshets.

The flow of the Chama partakes of the character of that of the San Juan with the exception of the rainy-season flow. This occurs in general during the months of July and August, and is characterized by freshets of great volume which at times are very destructive to property.

Concerning the amount of water carried by the river and its tributaries, there is but little data available.

During 1895-96 the hydrographic division of the United States Government Survey maintained a gauging station at Abiquiu, but sufficient data were not obtained to warrant an estimate of the maximum and mean flow of the stream, as the bottom is of an exceedingly shifting character.

On April 4, 1889, an estimate of the flow of the river and its tributaries was made by the same division, which is here appended, as it is of value in showing the relative importance of the various streams as well as suggesting the possibilities.

It will be well to bear in mind the fact that at the time these measurements were taken the spring flow had but begun, and would not reach its maximum until the middle of May.

Summary of water flowing in the tributaries of the Chama, as measured March 26 to April 4, 1889.

	Second-feet.
1. Oso	5
2. Ojo Caliente	75
3. El Rito	33
4. Frijoles	5
5. Canones (Lower)	14
6. Canjilon	28
7. Puerco	40
8. Gallinas	12
9. Cebolla	12
10. Nutrias	10
11. Nutrias	26
12. Brazos	150
13. Canones	8
14. Willow	12
15. Little Chama	95
Total	525

This estimate does not include the water in the main branch of the Chama above the town of Chama, which was flowing at the rate of at least 300 second-feet. The total discharge of the Chama at Abiquiu at this time was estimated to be 750 second-feet.

Irrigation in this district is more extensive than in that of San Juan, and whereas in the San Juan district the irrigated lands are principally confined to the main or trunk streams, in the Chama district the reverse is the case, by far the greater acreage being on the tributary streams in the mountains. This is explained from the fact that the streams display two distinct features in their course from the mountains to the Chama: first, an upper course characterized by deep canyons among the mountains, and second, a course characterized by wide, sandy river beds of comparatively light fall.

In the upper course there is never, or rarely, any scarcity of water, but in the lower sections along the wide valleys the seepage and evaporation are excessive and scarcity of water frequent.

The irrigated lands are usually found at the head of the valleys, taking the water from the never-failing mountain streams.

The total acreage cultivated in this district is 21,700 acres. This includes 4,500 acres between Espanola in the valley of the Rio Grande and the junction of the Chama, which is irrigated from water diverted from the Chama.

This section is called Chama Abajo.

	Acres.
Chama Abajo and Chamita to Ojo Caliente.....	4,500
Chama, from Ojo Caliente to Abiquiu.....	1,500
Chama, from Abiquiu to La Puente.....	225

TIERRA AMARILLA VALLEY.

La Puente.....	900
Enseñada.....	1,650
Brazos.....	1,050
Park View.....	2,125

TRIBUTARIES.

Canones.....	600
Rio Puerco.....	450
Rio Gallinas.....	150
Ojo Caliente.....	3,150
El Rito.....	1,500
Cebolla.....	450
Canjilon.....	525
Las Nutrias.....	375
Las Nutritas.....	1,500
Vallecito.....	150
San Antonio.....	900

Total.....	21,700
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The last stream, although included in this district, flows into the Rio Grande in Colorado and should probably be placed in that district.

There has never been any shortage of water on the Chama, but it sometimes occurs on some of the small tributaries.

On El Rito the water is wholly used, there being no surplus whatsoever, and during a year of drought it is severely felt.

On the Gallinas the same conditions apply, and a shortage has also been felt on the Coyote Creek, a small branch of the Puerco.

With these exceptions there is a large surplus in all sections of this district.

While the irrigated area is 21,700 acres, the total area under ditch is about 40,000 acres, and with some slight exceptions this entire area could be brought into cultivation without any increase in the present system, while the total irrigable acreage in the district will reach 80,000 and possibly 100,000 acres.

TAOS.—DISTRICT No. 3.

Geographical location: Central northern portion of New Mexico, covering the major portion of Taos County. Acreage irrigated, 36,240.

This district extends from the Chama district on the west to the crest of the Taos range on the east, and from the Colorado line on the north to and including the drainage of the Embudo Creek on the south.

It is characterized by the great number of small perennial streams which, rising in the high ranges on the east, debouch at about one-third the general width of the district upon the high mesas forming the central and western thirds.

The Taos range, comprising the catchment area from which these streams derive their waters, is unsurpassed in the Territory. It ranges in altitude from 7,000 to 13,000 feet above sea level, with slopes tree-clad, and the precipitation is probably greater than in any other section of the Territory.

No general description can cover the diverse features of the various sections of this district, which must be studied in detail to afford a true conception of the conditions.

Beginning at the northern limit and passing south, the first stream reached is the Costilla. This stream passes into Colorado immediately beyond the town of Costilla, but only that portion in New Mexico will be considered.

The total irrigated area is 800 acres of which 600 are in the canyon and 200 in La Costilla proper. The water supply is ample, not over one-fourth the flow being used in ordinary years; but scarcity has been felt sometimes in June, before the summer rains have brought the rainy-season flow.

Passing south a group of small streams about Cerros is reached. These streams are the Latir, Rito Primero, Rito del Media, and Datil, whose combined flow will not exceed 20 second-feet. A small portion of the Cabresto Creek is also diverted to aid in this section, as the water supply is always scanty.

The total irrigable lands under ditch is at El Cerro, 1,500 acres, and at El Latir, 450 acres, of which all is under cultivation, or a total acreage for the section of 1,950 acres. There is no surplus water whatever from this section, all being in use, although the acreage might possibly be increased by storage.

To the south is the Rio Colorado with its main tributary, the Cabresto. On this stream the great body of irrigated land is grouped about the junction of Cabresto with the Rio Colorado at the town of Questa, and water is drawn from both streams. Here there is always a large surplus of water, although about one-fourth the normal flow is diverted across a divide in the mountains to Elizabethtown, where it is used for mining.

Notwithstanding this loss, only about one-fourth the flow of the streams is diverted for irrigation.

The total area under ditch along these streams is about 3,000 acres, while 2,000 acres are irrigable. The total irrigable acreage is probably 5,000 acres, for which there is an abundant supply of water.

South of the Rio Colorado and between it and Arroyo Hondo is a tract of land some 8 miles wide and traversed by several creeks whose waters are used for irrigation.

These are Lerma Canyon, Arroya San Cristobal, and Agua del Lobo, of which the San Cristobal is the largest.

At Lerma Canyon the acreage irrigated is about 40 acres, with no possibility of increase, all the available water supply being in use. At San Cristobal there are 500 acres actually under ditch and irrigated, but the stream is small and entirely used in serving this body of land, so that it is doubtful whether any further increase is possible. At Agua del Lobo there are 250 acres under ditch, all of which is in cultivation. The water supply is scanty, and the greatest care is necessary to carry them through the month of June. No improvement in the situation is here possible.

The Rio Hondo is next in order to the south. This stream lies in a valley at general level of from 400 to 500 feet below the surrounding country, with a general width of about three-fourths of a mile.

In the lower valley about the Arroyo Hondo there are 1,500 acres under ditch, of which 1,200 are in actual cultivation.

In the upper portion of the valley about San Antonio the irrigated acreage is about 300 acres, or a total of 1,500 acres served by the stream.

The water supply is abundant, there being at times a heavy surplus, and it is probable that the irrigable acreage served from this stream could be increased to 3,000 acres at a slight expense, while with storage it is probable that 10,000 (estimated) acres could be improved.

We come now to the group of five streams, which water the so-called Taos Mesa, and uniting form the Taos Creek, which enters the Rio Grande about 12 miles southwest of Taos.

These creeks are from north to south, the Seco, Lucero, Pueblo, Ferdinand, and Rio Grande de Taos; each will be considered separately.

The Seco is peculiar in that not only is there an entire consumption of its own flow, but the Rio Hondo and the Lucero are also drawn upon to serve its land. The system is so inextricably mixed that it is absolutely impossible to assign to each the acreage irrigated by each individual stream, only the total acreage being obtainable. This is 2,600 acres actually cultivated, while 3,500 acres are under ditch.

As before stated the entire flow of the Seco is used and no further development here is possible, excepting from increased diversion from the Rio Hondo. No further diversion is possible from the Lucero without a corresponding deprivation of lands to the south.

The Lucero enters the valley from the north and waters the land between it and the Pueblo Creek, as well as a tract extending north to the Arroyo Seco.

About one-third the entire flow is diverted toward the Arroyo Seco, while the remainder is used on the lands to the south. The acreage to the south under ditch and irrigated is considered with Pueblo Creek, as that to the north has been, under the Arroyo Seco.

The entire normal flow of the Lucero is diverted for irrigation, and no increase in the irrigable acreage served by this creek is possible, excepting by storage or a more economical use of the water at present diverted.

Pueblo Creek enters the valley some 2 miles above Taos, and is one of the largest streams in the entire district.

The lands along this creek had been cultivated by the Indians of Taos pueblo a long time prior to the advent of the Spaniards in the Territory, and in fertility and productiveness are not surpassed in the Territory. The irrigated lands although practically continuous are separated into three divisions, known locally as Pueblo, La Placita, and Ranchito.

At Pueblo the cultivation is wholly by the Indians, and the acreage is constant from year to year, 1,000 acres being under ditch and irrigated. At La Placita 3,000 acres are under ditch, but only 2,000 in cultivation, while at Ranchito 2,000 acres are under ditch with 1,500 acres in cultivation. The total for the stream is 6,000 acres under ditch and 4,500 acres actually irrigated and in cultivation. The water supply is ample, there being a surplus of at least one-third the summer flow at the time when water is most in use and the flow least.

The Ferdinand or Taos Creek enters the Pueblo a short distance below Taos.

The amount of land under ditch on this stream is about 2,500 acres, with 2,000 in actual cultivation. The entire flow of the stream is used for this purpose, there being no surplus water whatever, and in addition a part of the flow of Pueblo Creek is diverted to these lands.

Scarcity of water occurs in June in years of drought. No further improvement is possible on this stream without storage.

The Rio Grande de Taos is the most southern stream of those forming the Taos drainage. It has one tributary, the Rio Chiquito, which enters some 2 miles below the head of the valley and along whose banks there is a small amount of irrigated lands. In the valley of the Rio Grande de Taos irrigation is practically continuous on both sides of the creek, from the head of the valley to Las Cordovas, its junction with the Taos River. The main body of land, however, lies in the vicinity of Los Ranchos de Taos. There are 10,000 acres under ditch, of which but 6,000 are in cultivation.

The water supply is sufficient for about 12,000 acres in the dry season when the greatest amount is required, and could be made to serve a much greater acreage by storage.

Embudo Creek is the farthest to the south of all the streams, forming the Taos district. Its principal tributaries, from north to south, are the Rio Pueblo, Rio Penasco, and Las Trampas.

On the Rio Pueblo the land under ditch is 1,600 acres, all of which is in cultivation; of this acreage the Indians of Picuris pueblo control 600 acres. The water supply is ample, only about one-fourth of the total flow of the stream being diverted.

The Penasco has four centers of irrigation, which are, from east to west, Llano Largo, Santa Barbara, Penasco and Rio Lucio. The acreage under ditch and in cultivation is, at Llano Largo, 800 acres; Santa Barbara, 1,000; Penasco, 2,000, while at Rio Lucio 800 acres are served, or a total of 4,600 acres from the entire stream.

The flow of the Penasco is in excess of the service required, and after El Llano, Chamisal, and all the other demands have been deducted, there is still a surplus of about one-fourth the total flow of the stream.

At El Llano and Chamisal creeks there are, respectively, 2,500 and 3,000 acres under ditch and in cultivation; but the water supply is always short and the Penasco is drawn upon to supply the deficiency.

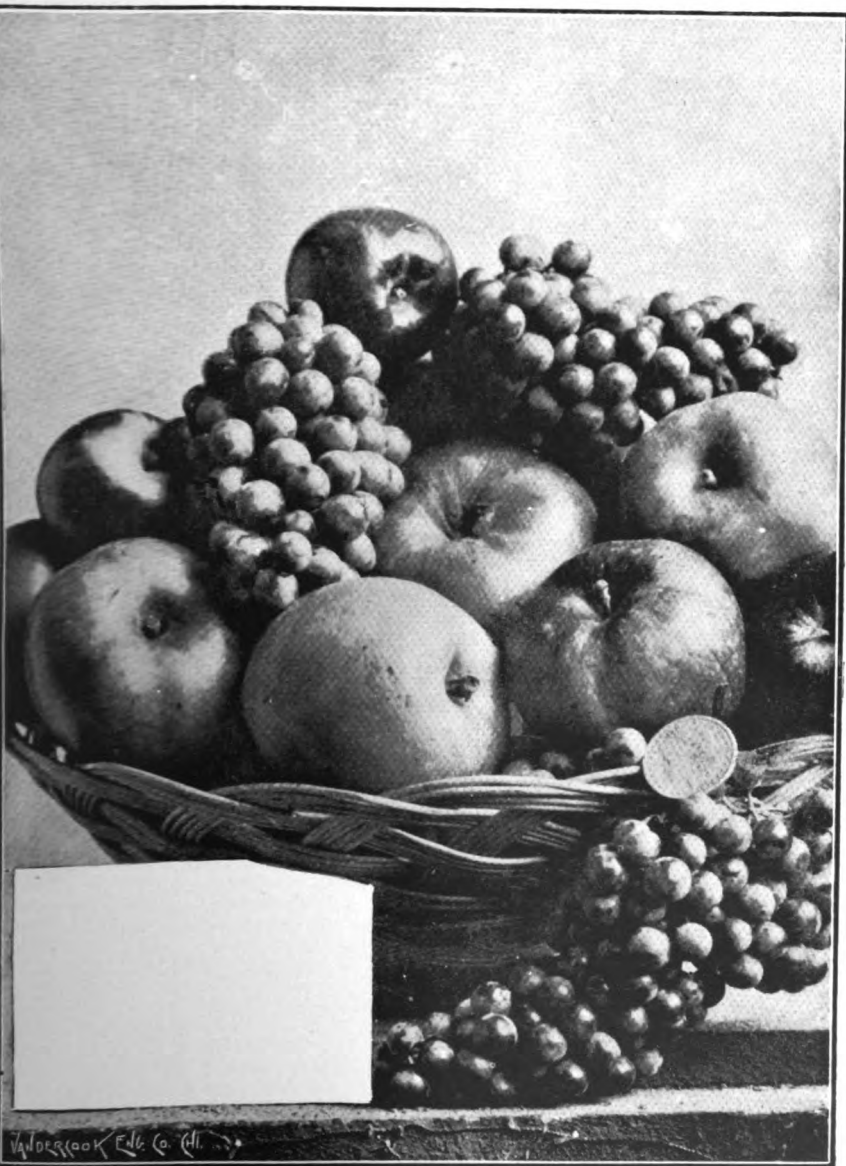
On Las Trampas Creek the acreage under ditch is divided as follows: At El Valle, 500 acres; Las Trampas, 1,500; Vallecito, 100 acres, all of which is under irrigation. This, with 300 acres at Ojo Zarco, for which water is diverted from this creek, makes the total of 2,400 acres, with an estimated surplus of one-eighth the total flow of the stream.

On Embudo Creek between Las Trampas and its junction with the river the acreage under ditch and in cultivation is 800 acres.

SANTA FE.—DISTRICT NO. 4.

Geographical location: Central northern portion of New Mexico, embracing portions of Taos, Santa Fe, and Bernalillo counties. Acreage irrigated, 17,750.

This district embraces the drainage of all streams from Embudo Creek north to and including the drainage of the Gallisteo on the south, and from the Santa Fe Mountains on the east to the valley of the Rio Grande on the west.



BASKET OF SANTA FE COUNTY FRUIT.



The district is exceedingly broken, and is characterized, as is the Taos, by the many small streams rising in the mountains and flowing westward toward the Rio Grande.

These streams are perennial in the upper portion of their course in the mountains, and the irrigated sections of the district are confined to the small mountain valleys and the immediate portion of the plains adjacent to the point where they leave the mountains and pass upon the plains.

Although perennial in their upper course it is exceedingly rare that any portion of the normal flow during the months of June, July, August, and September, with the exception of the Rio Santa Cruz and Pojuaque, ever reaches the Rio Grande, for in general the major portion of the waters is used for irrigation, and what small surplus of the normal is left is lost by seepage and evaporation in the many miles of wide, sandy river bed lying between the foothills and the Rio Grande.

In the so-called rainy season, which occurs during July and August, all these streams are subject to frequent freshets; and in common with other districts in the Rio Grande, drainage contributes materially to the flow of that stream.

The Santa Cruz, the most northerly stream in this district, rises in the Santa Fe range and flows in a generally northwesterly direction to the point where it leaves the mountains at Potrero, thence westward to its junction with the Rio Grande.

Irrigation along this stream is confined to that portion lying between Potrero, where the valley widens, and the Rio Grande. The irrigated lands occupy the valley proper and extend almost continuously on both sides of the river between the limits mentioned.

The total acreage under ditch and served by this stream is 2,500 acres, of which 900 acres are wholly within the upper portion of the Santa Cruz Valley. Although drawing its water supply from the Santa Cruz, the remaining 1,600 acres, occupying the lower Santa Cruz Valley, and lying along the eastern edge of the Rio Grande Valley to the north and south of the junction of the Santa Cruz, is in reality a portion of the Espanola Valley of the Rio Grande.

Practically all the land under ditch is in actual cultivation.

The flow of the stream during the fall, winter, and spring is large and is more than sufficient for all demands upon it up to about June 1. During June, July, and August the entire normal flow is diverted to the land, and at times there is scarcity in the supply, but relief is had in the freshets which occur regularly during these months.

It may be said that no further increase in the irrigable acreage is possible without storage, but there are good reservoir sites in the canyon which could be improved at little expense.

To the south of the Santa Cruz is Las Truchas. This stream is of minor importance, its flow being very small. The area irrigated on this stream is about 150 acres, for which the supply is sufficient. What little surplus water there is at times is lost by seepage and evaporation a short distance below the town of Truchas, no flow reaching the Rio Grande excepting during heavy freshets.

The Nambé or Pojuaque is the next in order to the south. This stream is smaller and of much less importance than the Santa Cruz, but with its tributary, the Tesuque, supports examples of irrigation antedating the Spanish occupation.

The irrigated lands are confined to the rich bottoms on either side of the stream from a point one-half mile above El Salto del Agua to the mouth of the river at the Rio Grande. Here, as in the case of the Santa Cruz, the water is used on the lands of the Rio Grande Valley proper at and to the south of the pueblo of San Yldefonso.

The total acreage under ditch, which is also that in actual cultivation, is 1,800 acres, including that portion of the valley lands of the Rio Grande served by this stream.

A short distance below the town of Pojuaque, the Tesuque enters from the south. This stream is bordered on either side from the fork of Bishops Creek to its junction below Pojuaque by small irrigated tracts, the largest body of land lying in the vicinity of Tesuque pueblo.

The total acreage under ditch is 1,200 acres, all of which is in cultivation. The water supply on the Nambé or Pojuaque is ample at and above the town of Pojuaque, but below this point there is a chronic shortage.

At San Yldefonso the Indians have reinforced their supply by bringing water from the Rio Grande through the Hobart ditch, but the lands along the lower reaches of the river depend, during July and August, upon the freshets which occur in these months.

During the fall, winter, and spring there is a large surplus which might be stored above El Salto del Agua at a small cost, and would increase irrigable acreage by at least 2,500 acres.

The water supply of the Rio Tesuque is similar in character but much less in quantity, there being a sufficiency above the pueblo of Tesuque but a greater scarcity below. Even at Tesuque a scarcity occurs at times. Here, too, rainy-season flow or freshets are depended upon for the maturing of crops.

The question of storage on this stream is uncertain, no sites being known; but it is only proper to state that no examination has been made.

South of the Nambé is the Rio Santa Fe.

This stream rises in a series of three small lakes lying below the crest of **Lake Peak** at an altitude of about 11,000 feet. It flows in a southeasterly direction and leaves the mountains about 3 miles east of Santa Fe. From this point to its junction with the Rio Grande it flows through gently sloping plains with the exception of a short stretch where it breaks through **La Bajada Canyon**.

Its waters have been in use for irrigation from the first settlement of the city by the Spaniards, indeed, even prior to that time by the Indians of the ancient pueblo, which occupied the site of the present city.

The irrigated lands are in two sections—the first extending from **Ewing's Ranch**, about 7 miles above Santa Fe, to **Agua Fria**, some 6 miles below, while the second extends from **Cieneguilla** to **La Bajada**, on the lower stretch of the river.

On the upper section, in the canyon above the reservoir of the **Santa Fe Water and Improvement Company**, irrigation is confined to small isolated patches, the total aggregating 100 acres under ditch and in cultivation. From this point to some 2 miles below the city is the largest body of land in cultivation on the stream, the acreage under ditch being 2,400 acres, all of which is in cultivation. About **Agua Fria** the acreage is 800, making a total of 3,300 acres on the upper portions of the stream.

From **Cieneguilla** to **La Bajada**, including **La Golandrina Springs** and **Alamo** or **Bonanza**, 1,100 acres are in cultivation, this being the acreage under ditch. **La Golandrina Springs** and **Alamo** or **Bonanza**, however, do not depend upon the Rio Santa Fe for water, but upon springs, the flow of which is constant and wholly in use.

The cultivation along the Rio Santa Fe is as intense and the duty of water higher, perhaps, than in any other sections of the Territory on account of the scarcity of water. The entire flow of the stream has been in use for years, and it is only by the most careful and economical use of water by the cultivators that crops are brought to the high state of perfection for which they are noted.

Storage must be resorted to before any increase in the acreage cultivated can be looked for. Many reservoir sites are to be found in the canyon and along the arroyo.

In 1892 and 1893 a dam was constructed across the river some 2½ miles above Santa Fe with an impounding capacity of about 500 acre-feet. The primary object of this enterprise was the city supply, but a small portion is used in pipe irrigation. There is still a surplus of the flow of the stream amounting to about 2,500 acre-feet. This surplus occurs, however, in the form of rainy-season flow or flood flow and early-spring flow and is not available for irrigation without storage.

Along the lower portion of the river, from **Cieneguilla** to **La Bajada**, there is always great scarcity of water, except during the early spring and at time of freshets.

This section relies more upon springs in the river bed above **La Bajada Canyon** than on the flow of the river.

It is very seldom that the flow of the river reaches the Rio Grande excepting in times of very high spring flow and in time of freshets. Usually what small flow may occasionally pass **La Bajada** is lost in seepage and evaporation in the wide sandy bed between that point and the Rio Grande.

The Rio Santa Fe has one tributary, the **Arroyo Hondo**, along the headwaters of which irrigation is practiced to a very limited extent. The flow of this stream is exceedingly small and no water is ever delivered to the Rio Grande except in time of freshet.

The irrigated lands are wholly along the upper stretches and are in small detached areas in the vicinity of **Rodriguez** and **Gonzalez ranch**, not more than 200 acres being in cultivation.

No further increase in this acreage is possible, even with storage, as the drainage area above these points is exceedingly small, and freshets occur only at long intervals.

South of the Rio Santa Fe is the Rio **Gallisteo**. The water supply of this is small and precarious, and, excepting in time of flood, no flow ever reaches the Rio Grande.

Irrigation is wholly confined to the upper portions of the streams and to the small valleys opening into it, the major portions being in the vicinity of **Gallisteo**.

From the head of the stream at **Glorietta Mountain** to **Cerrillos**, between which points are located the irrigated areas, there are 1,200 acres under ditch, while on the **Arroyo San Cristobal** from **Ojo del Baca** to its junction with the **Gallisteo** there are 400 acres, or a total of 1,600 acres under ditch and in cultivation along the stream and its tributaries.

This acreage can not be increased, as the entire flow is in use. Freshets occur frequently during June, July, and August, and are at times of great volume, but no storage sites are known.

is completes the list of streams in the Santa Fe District, but there are some small tracts located in the Sandia Mountains and utilizing the flow from some small streams in the vicinity.

These areas are incapable of improvement, as the water supply is constant and rarely in use.

The acreage is as follows:

	Acres.
Huertes and Placitas.....	300
de Gato.....	100
mal.....	100
Pedro.....	150
n.....	150
Antonio and Gutierrez.....	200
ras.....	300
	<hr/>
	1,300

With the exception of the Tijeras these localities are not even subject to freshets, owing to the limited drainage area above them.

The Tijeras, however, at times discharges large volumes of flood waters and has one or more reservoir sites, but owing to the great amount of debris brought down the time of flood storage is probably impracticable.

JEMEZ.—DISTRICT No. 5.

Geographical location: Central northern portion of New Mexico, covering portions of Rio Arriba and Bernalillo counties. Acreage irrigated, 4,500.

South of the Chama and west of White Rock Canyon lies the Jemez district. The chiefment area of this district is embraced between the west slope of the Jemez Mountains, which reach an altitude of 11,000 feet, and the eastern slopes of the Cimarron, whose summits are somewhat lower.

The precipitation on these slopes is generally heavy, and is collected by the many small streams forming the Jemez. These streams flow through long, narrow, but very fertile valleys in their upper reaches, and the water supply is excellent, but about the pueblo of Jemez south to its junctions with the Rio Grande the rivers pass through a sandy, barren country; its bed is wide, and most of the water is lost by seepage and evaporation, leaving but little if any to reach the Rio Grande, except in early spring and in time of floods.

There is an abundant supply of water above San Ysidro, but below this point there is great scarcity, so great, in fact, the Indians of the pueblo of Santa Ana have been compelled to abandon their farming lands on the Jemez and take up land on the Rio Grande, some 10 miles distant.

The acreage irrigated in this district is about 4,500 acres, and it may be said this is not increased excepting by storage. It is but a small percentage of what could be brought under cultivation by improved methods, for during the early spring and in time of floods in June, July, and August, there is a large surplus of water, which, as there are good reservoir sites available, might readily be conserved.

PUERCO.—DISTRICT No. 6.

Geographical location: Central western portion of New Mexico, covering parts of Rio Arriba, Bernalillo, and Valencia counties. Acreage irrigated, 13,980.

This district includes the entire drainage area of the Rio Puerco and its tributaries, extending from the Chama and Jemez districts on the north to the divide between Puerco and Salado on the south. Its eastern limit is the foothills bordering the Rio Grande Valley, and the western the Continental Divide.

The character of the country is hilly and broken. Its altitude ranges in general from 4,000 to 7,000 feet, and the precipitation is very light, being about 7 inches annually, and as a consequence there are but few perennial streams.

The major part of the precipitation occurs usually during the months of June, July, and August in the form of very heavy rains or cloud bursts, resulting in torrents which for volume and duration are not exceeded in the Territory, excepting on the river Pecos.

At Rocky Ford floods discharging a maximum of 32,000 second-feet have been observed. Such floods, however, are unusual, this being the maximum, but freshets discharging from 2,000 to 3,000 second-feet are comparatively frequent during the rainy season.

Much the greater portion of this district never furnishes water to the stream, the precipitation that reaches the arroyos being lost by seepage in their sandy beds.

The Rio Puerco runs from north to south through the eastern portion of this dis-

trict, receiving its entire perennial supply through a number of small streams from the western slopes of the Nacimiento Mountains, but a small amount, however, reaching the main stream, which is dry south of Casa Salazar from the time spring flow ceases until about the latter part of November, with the exception of times of freshets.

From Casa Salazar to the mouth of the Puerco there are no irrigated lands excepting at San Ignacio, where 500 acres are in cultivation.

In years past most of the rich bottom lands for 40 miles south of Casa Salazar were under irrigation, but within the last fifteen or twenty years the Puerco has been cutting out its bed until now it flows in a tortuous channel with precipitous banks from 30 to 40 feet below the level of the valley, rendering it impossible with the crude methods of the Mexican settlers to raise the water sufficiently to bring it upon the lands, and causing the abandonment of the entire country, with the exception of the small acreage before mentioned at San Ignacio.

On the small streams—the San Jose, La Java, Los Pinos Creek, El Rito La Leche, and Rito del Nacimiento, at the head waters of the Puerco—irrigation is confined to small patches along the sides of the narrow valleys and will aggregate 700 acres.

From the east boundary of the San Joaquin Grant to Casa Salazar, between which limits irrigation extends, the irrigated areas are not continuous, but are located about the many small settlements, the acreage aggregating 2,980 acres.

Outside the above acreage the irrigated lands are scattered over the district wherever water may be found, the principal acreage being on the San Jose, which is the main tributary of the Puerco and its feeders. This stream rises on the Continental Divide and, flowing southeast, joins the Puerco about 4 miles east of San Jose station.

The normal flow is exceedingly small and is wholly consumed by the irrigation along the stream. During the rainy season, however, it discharges enormous quantities of flood water, and it is only by the conservation of their waters that the irrigable acreage can be increased.

On the upper portion of the stream, at the junction of the Cottonwood and Blue Water creeks, the Blue Water Land and Irrigation Company has constructed a dam 42 feet high, impounding water for the irrigation of their lands some 12 miles below. From this reservoir 2,000 acres are irrigated. There are no other storage systems in the district.

The principal irrigated acreage on the river is between Acoma and Laguna, and about 3,900 acres are served by water taken from the San Jose. About El Rito and Massita 800 acres are under irrigation, and these points mark the limit of the irrigated acreage down the river.

At Juan Tafoya about 200 acres are cultivated from springs in the canyon on the upper Salado, no further increase being possible.

In the vicinity of San Mateo about 600 acres are also served from springs, this acreage consuming the entire flow. In addition, 2,300 acres are in cultivation in detached areas throughout the district, this acreage consuming the entire water supply, with the exception of early spring flow and flood flow occurring during the rainy season.

Only by storage can this acreage be increased. There are a number of reservoir sites available, but only a careful study of the water supply can determine the possibilities of the district.

BLACK RANGE.—DISTRICT NO. 7.

Geographical location: Eastern half of the southwestern quarter of New Mexico, embracing portions of Socorro, Sierra, and Grant counties. Acreage irrigated, 9,270.

This district embraces all the drainage area from the western edge of the Rio Grande Valley to the Continental Divide and from the Puerco to the Mexico line.

It is a rough and broken country and the water supply exceedingly scant, the precipitation ranging from 4 to 6 inches during the summer, while the total per annum is probably in the neighborhood of 10 inches.

Irrigation is generally confined to the valleys of the few small streams flowing eastward toward the Rio Grande and to the valley of the Mimbres. None of these, however, discharge water to the Rio Grande, excepting during seasons of excessive snow fall or during very heavy floods.

Although the water supply is scanty, it is constant, and probably on this account a higher duty of water is reached in this district than in any other portion of the Territory.

On the Rio Salado 600 acres are irrigated, this consuming the entire water supply, with the exception of the excessively heavy freshets occurring during the rainy season.

On the Rio Alamosa 1,200 acres are irrigated in the vicinity of Canda de Alamosa, Monticello, and above.

The Cuchilla Negro serves 1,050 acres at and above Cuchilla. There are irrigated

from springs in the Rio Palomas, 540 acres; from springs in Las Animas, 500 acres; from springs in the Rio Perches, 100 acres; from springs in the Cienega Apache, 120 acres, and from springs in Bareda Creek, 160 acres. This acreage consumes all the water at several points, with the exception of the flood flow.

The Mimbres Valley is the seat of the largest irrigation areas in the district, the principal acreage being on the upper portion of the stream and its branches.

The total acreage under irrigation is about 5,000 acres, and in serving this body of land the flow of the stream is practically consumed.

Floods occur during the rainy season and of great volume, but this stream has no other outlet; in times of flood discharging its waters on the Florida Plains, where they are lost in the sands.

Here—particularly near Deming—is a region of country known to be 50 miles wide and 100 miles long from north to south, where an inexhaustible supply of water can be reached by wells no more than 50 feet deep. As this phase of the question is beyond the scope of this report, further mention of the matter has been omitted.

Reservoir sites are found through this district, and storage must be resorted to before further improvement may be had in this district.

COLORADO.—DISTRICT No. 8.

Geographical location: Southwestern portion of New Mexico, covering the western portions of Bernalillo, Valencia, Socorro, Sierra, and Grant counties. Acreage irrigated, 17,000.

The Colorado district embraces all the land west of the Continental Divide and south of the San Juan.

The topography of the country is greatly broken, being occupied by the Black Range, Mogollon, Tularosa Mountains, in which rise the head waters of the Gila, Salt, and Little Colorado rivers of Arizona. The principal streams are the Gila, San Francisco, and Zuni, which are perennial within the Territory.

No data is available as to the flow of these streams, but at present the water supply is sufficient for the acreage irrigated, although there has been some shortage during very dry years.

The irrigated acreage is also uncertain, but is probably about 9,000 acres on the Gila, 6,000 on the San Francisco, 1,000 on the Zuni, with 1,000 acres scattered along the head waters of small streams in detached areas.

Reservoir sites are to be found along the streams, and it is probable that storage must be resorted to before any material increase in the irrigated areas may be had.

As the streams are subject to frequent and violent floods, it is probable that the flow is in excess of the economical storage capacity of the reservoir sites available.

CANADIAN.—DISTRICT No. 9.

Geographical location: Northeastern portion of New Mexico. Acreage irrigated, 36,000.

This district embraces the drainage area of the Canadian River and its tributaries from the Colorado line south to the point where it enters the State of Texas and from the crest of the Santa Fe and Taos ranges on the west to the eastern limit of the Territory, covering all of the counties of Colfax, Mora, and Union, and the major portions of San Miguel and Guadalupe.

As in the case of most of the other districts, it is characterized by the many small streams which, although perennial in their upper course, are usually dry along their lower stretches during the greater portions of the irrigating season.

The Santa Fe and Taos ranges, in which these streams have their sources, afford one of the best catchment areas in the Territory, and the flow of the streams heading in these mountains is constant and always to be depended upon. As a consequence, the irrigated area is almost wholly confined to the valleys of these streams in the western portion of the district, while the eastern portion, being in reality a part of the Great Plains and dependent for its water supply upon the summer rains (and therefore very uncertain), is almost wholly devoted to grazing.

The various streams will be considered in their order from north to south.

The Chico Rico has its source along the southwesterly slope of the Raton Plateau, flowing thence in a generally southern direction and joining the Canadian River about 4 miles above the town of Dorsey.

The flow of this stream is small but permanent, probably not exceeding 20 second-feet, excepting during floods. Floods occur during June, July, and August, and are of great volume.

The normal flow of the river is wholly consumed, a portion being impounded by a dam some 8 miles above Raton and carried by a pipe line to that town for domestic supply, while the surplus is used for irrigation in the Chico Rico Valley. The acreage in cultivation is unknown, but is probably about 1,000 acres.

No further increase in this acreage is possible without storage, but good reservoir sites are in the vicinity, and at a comparatively slight expense sufficient water could be impounded to irrigate 5,000 acres in addition.

The Vermejo rises in the extreme northwest corner of the district, in the Culebra or Costilla Range, flowing southeast to a junction with the Canadian River some 6 miles below Maxwell City. Its tributaries are the Caliente, the Saltpeter, and the Van Brimmer.

The flow is permanent, the mean being about 70 second-feet during the irrigation season, from April to September, inclusive, and about 10 second-feet during the nonirrigation season.

The stream is subject to frequent and heavy floods during June, July, and August, measurement having shown a discharge at these times of 900 to 1,000 second-feet, amounting to 2,000 acre-feet in twenty-four hours. On the upper portion of the stream there are about 100 small individual ditches, serving small tracts. There are also about 9 other individual ditches between Dawson's and the Montgomery Ranch that are much larger, having a capacity of from 5 to 15 second-feet each.

Of corporation canals there are two, belonging to the Maxwell Company, each with a capacity of 400 second-feet.

The acreage irrigated under these systems is 11,000 acres, of which 3,000 acres are irrigated on the upper portions of the river by the 100 small ditches, 3,000 by the 9 larger ones between Dawson's and the Montgomery Ranch, and 5,000 under the Maxwell's Company ditches to the north of Vermejo.

The normal supply of the stream is entirely consumed by the present system.

The Maxwell Land Grant Company has resorted to storage, having constructed some eight or ten reservoirs, with a combined capacity of 6,000 acre-feet.

Under the individual ditches there is one small reservoir of 50 acre-feet capacity, but with these exceptions the ditches rely wholly on the river flow. This flow is always ample for all purposes in the spring, and in fact there is a good surplus, but during the later part of the season there is always a scarcity.

Reservoir sites are so located as to be capable of every economical improvement, and it is probable that 10,000 acres additional will ultimately be brought under cultivation by this means.

The Cimarron River, one of the largest streams in the district, is formed by a number of small streams originating in the Taos Range, and flows in a general southeasterly direction to a junction with the Canadian near the southeast corner of the Maxwell Grant. Its principal tributaries are Ute Creek, Ponil, Cimarroncito, Uracca, and Rayado, in all draining about 40 miles in length of the eastern slope of the Taos Range.

The stream is perennial, and its mean flow from March to July, inclusive, is about 500 second-feet. In August and September this flow decreases gradually, the mean flow in the nonirrigation season being only about 50 second-feet; the total annual discharge of the stream reaches from 150,000 to 200,000 acre-feet. On this stream freshets occur only occasionally, there being at times periods of several years intervening between them.

There are thirteen individual ditches and one corporation ditch on the Cimarron and its tributaries, divided as follows:

On the Cimarron the Springer Ranch ditch, capacity 150 second-feet; two smaller ditches on the same ranch carrying 20 and 40 second-feet, respectively, and two ditches near the town of Cimarron carrying 20 second-feet each.

On the Ponil there are three ditches, carrying 10 to 20 second-feet each.

On the Rayado there are three ditches, carrying about 20 second-feet each.

On the Cimarroncito there are two ditches, carrying 10 and 20 second-feet respectively.

The corporation ditch is the Maxwell Land Grant Company's Springer ditch, with a capacity of 400 second-feet.

In the spring of the year there is a surplus of water over the amount required for all the ditches, but during the late summer and fall there is but very little water for any of them.

The Maxwell Land Grant Company has constructed four storage reservoirs, the largest of which, the Springer reservoir, covers an area of 300 acres and has a capacity of 5,000 acre-feet; the others have a combined capacity of about 1,000 acre-feet.

The land irrigated under these systems is about as follows: 1,000 acres under the small ditches along the Cimarron bottom; 500 acres under the Ponil ditches; 1,000 acres under the Rayado ditches; 2,000 acres under the Maxwell Company's ditch, and 2,500 acres under the Springer Ranch. The whole consumes about 25 per cent of the total annual discharge of the Cimarron, leaving a surplus of from 100,000 to 150,000 acre-feet passing down the Canadian to the gulf each year.

This entire flow is capable of conservation, as there are a number of good reservoir sites at different points in the Cimarron drainage.

Under the Springer Ranch ditch one reservoir site can be improved with an

impounding capacity sufficient to irrigate 3,000 acres. On the north side of the Cimarron River are two large basins with a storage capacity of about 10,000 acre-feet. In the Moreno Valley, at the head of Cimarron Canyon, is situated a reservoir site where a dam 125 feet high will form a reservoir covering 2,500 acres and with a capacity of 100,000 acre-feet. Smaller sites are to be found in Ponil, Cimarroncito, Uracca, and Rayado canyons.

About 100,000 acres could be irrigated from the Cimarron system and 140,000 acres in all could be irrigated by utilizing all the available reservoir sites in which the surplus water could be stored.

The Mora River is formed by a number of small streams rising in the Mora and Las Vegas ranges. In its eastern course to its junction with the Canadian it receives the waters of the Coyote, Cebolla and Sapello, all of which are important tributaries.

These tributaries drain about 40 miles in length of the eastern slope of the mountains and play an important part in the determination of the stream flow.

The entire normal flow of the Mora and its tributaries during the irrigating season is consumed in irrigation, there being no surplus waters whatever, except during the nonirrigation season and during the season of freshets. In fact there is a chronic scarcity of water, which in the case of the Coyote, Cebolla, and Sapello occurs even as early as April.

This want of water has been felt only within the past fifteen years and is due, not to any increase in the acreage cultivated, but to the cutting of the timber on the mountains in which these streams rise. In the words of an irrigator of thirty-five years' experience in this section, "If the destruction of timber along the head waters of the streams is not stopped, this section of New Mexico will soon be another Spain."

As it is, each year the freshets are increasing in frequency and volume, the period of drought becoming longer and the scarcity of water more keenly felt. Already many acres of the most valuable and fertile farming lands have been abandoned from this cause.

In seeking relief from these conditions two ditches have been built, taking water from the Rio del Pueblo or Piouris Creek in the Taos district and diverting it through passes in the mountains. One is carried into the Agua Negra Creek and the other into the San Antonio, both being small tributaries of the Mora Creek.

The diversion of the water by these two ditches is not continuous, being resorted to during the periods of greatest scarcity.

All the ditches along these streams are either community or private, and the acreage irrigated on the several streams as follows:

	Acres.
Ocate.....	2,000
Coyote.....	2,300
Cebolla.....	2,200
Manuelitos.....	2,000
Sapello.....	2,600
Mora.....	5,700
Total.....	16,800

Storage has been resorted to in but one instance, and that on the Sapello about 3 miles above Watrous, where by individual effort diversion has been made to a series of small lakes to the south of the stream, which are utilized as reservoirs. The combined capacity of these lakes is sufficient for the irrigation of about 500 acres.

There are four reservoir sites along these streams, but too large for their improvement to be undertaken by individual effort. The first is on the Mora River, where, by a 60-foot dam in a narrow gap above La Cueva, a reservoir would be formed covering 620 acres, with a capacity of 5,400 acre-feet.

At Buena Vista, where the Mora River enters a narrow canyon, a dam of 90 feet in height would form a reservoir covering 1,770 acres and with an impounding capacity of 38,000 acre feet. The town of Buena Vista would be wholly submerged by the construction of this dam. At the junction of the Manuelitos Creek with the Sapello a dam of 100 feet in height would cover 1,037 acres and give an impounding capacity of 41,000 acre feet.

In the Cherry Valley, below Watrous, is a natural reservoir requiring no dam, which would be filled by a canal from the Mora River. Its area is about 800 acres, with an impounding capacity of 15,000 acre-feet.

The question of the water supply for these reservoirs is problematical and only capable of determination by careful investigation. It is probable that only flood waters or rainy-season flow may be depended on to fill them, with perhaps a small amount of the nonirrigation-season flow. As before stated, however, the floods are frequent and of great volume, probably as high as 5,000 second-feet.

From the junction of the Mora to the eastern limit of the Territory the Canadian

receives no tributaries worthy of the name. There are a number of creeks (so called) at Ute Creek, the Pajarito, etc., but these are not perennial in any sense and it is but very seldom that they are even subject to floods. At points widely separated water is at times found in pools in the bed of the stream.

After a careful investigation of this portion of the district I have found only 80 acres in cultivation, and that along the Ute Creek.

Two hundred acres is probably the amount of irrigated land in the Canadian district not included on the streams mentioned above.

PECOS.—DISTRICT No. 10.

Geographical location: Southeastern New Mexico, covering all of the counties of Chavez, Eddy, and Lincoln, and portions of Mora, San Miguel, Guadalupe, Valencia, Dona Ana, and Socorro. Irrigated acreage: 54,320.

With the exception of the Rio Grande, the Pecos is the most important stream in the Territory. Its length is so great and its conditions so varied that it has been deemed advisable to consider it in two sections, the Upper Pecos extending from the head waters to Roswell, and the Lower Pecos extending from Roswell to the south boundary of the Territory.

The river rises on the eastern side of the Santa Fe range and flows for a while as a typical mountain stream through narrow valleys and deeply-cut gorges; then, leaving the tilted rocks, cuts the horizontal strata of the mesa country, this horizontal character of the rocks prevailing throughout the Pecos Valley. Among the sandstones the country is eroded and broken by arroyos, and the amount of agricultural land is necessarily small.

Below Fort Sumner, however, the topography of the valley changes. The canyon-like walls disappear and are replaced by low, rolling hills. The ascent from the river on each side becomes more and more gentle toward the south until, near Roswell, there is an imperceptible gradation from the flood plain to the prairie, this change in the topography being due to the change in the character of the rocks—limestone gypsum—prevailing throughout this fine agricultural land. Arroyos and gulches become rare, and canyons are practically unknown, the passage from canyons to prairie land being very gradual.

The drainage of the Lower Pecos is in New Mexico and is very imperfect, and there are broad tracts of country having no surface drainage whatever. The water sinks into the limestone rocks and establishes an underground drainage. The consequence of this is the formation of numerous shallows—"dry lakes"—which are in reality sink holes, many of these draining large areas. These contain water each year, and it is a constant surprise to the people of the country that they do not leave an alkaline crust upon disappearing, as would result if the water escaped by evaporation. East of the Pecos is the rolling prairie country of the Staked Plain, and to the west the White and other mountain chains rise out of the broken plain.

The main Pecos is formed by the confluence of the Gallinas with the Pecos at La Junta. Water flows perennially in these streams, at least as far down as the Atchison, Topeka and Santa Fe Railroad, but between this line and La Junta the water entirely disappears by evaporation and seepage during many months of the year. On January 30, 1889, the bed of the Pecos at Las Colonias was so dry that a well 15 feet deep barely furnished the water supply for the stock and citizens of that town. A mile or two above Eden some small springs flow into the Pecos, and from this point the river channel constantly contains water. The river valley shows signs of powerful erosion, due to the floods of the spring and summer months. North of Puerta de Luna the river has a rapid slope and is kept within its banks in time of flood, but below this point the water becomes muddy. In time of flood it overflows the flood plains extensively, but in low water meanders about among the sand bars in the river bed. Above Agua Negra Chiquita, near Santa Rosa, the water is practically free from alkali, but this stream and every one south of it add to its alkaline character.

The most important tributaries of the middle Pecos, because of the constant source of supply, are the Agua Negra and Agua Negra Chiquita, entering just above Puerta de Luna. The latter, on the east side of the river, receives an unfailing supply of water from two alkaline springs. The smaller rises out of the ground in a canyon about 3 miles from the Pecos and carries, it is estimated, 6 second-feet. The larger spring has its source about a mile and a half from the Pecos, at the base of a low sandstone cliff on the edge of an alkaline marsh. It is remarkable for its size and depth, the basin of the spring having a diameter of about 70 feet, and a stream of water flows from it carrying about 15 second-feet, receiving additions from numerous small springs on the way through the marsh to the Pecos.

The Agua Negra flows from the Canyon Pintada, a very long arroyo on the west side of the Pecos, draining a large area of Mesa country on the east side of the Manzano Mountains. During the summer rains, when great floods of water rush down the canyon, it is reported that little or none reaches the Pecos through the canyon,



IRRIGATED EGYPTIAN CORN IN PECOS VALLEY.

the greater part sinking into the arroyo bed, at one point, it is said, actually flowing into the ground through a hole. Several springs appear at various places, but they soon sink into the sand.

About 3 miles from the mouth of the canyon a large and constantly flowing spring supplies a stream of water of about 7 second-feet. This may be in part the water which disappears farther up the canyon, but its constancy would seem to indicate some additional and more distant source. It is a clear, alkaline water, which from its black color has been called *Agua Negra* by the Mexicans.

These two streams and numerous smaller springs furnish the Pecos with a considerable body of water.

At *Puerta de Luna* the river in early February is usually 150 to 200 feet wide and 2 feet deep in places, with an average depth of one-half foot or less and a velocity of not more than 3 feet per second. Its bed is of changing sand and is fully 200 yards wide between the flood plain banks, showing that powerful floods must fill the river at times when it overflows its banks.

It is a treacherous stream, more difficult to control than even the *Rio Grande*.

Near *Puerta de Luna* it is continually encroaching upon its banks and portions of several farms have been washed away within a few years.

Excepting occasional small springs from the *Agua Negra* and the *Arroyo Yeso* there are no living tributaries to the Pecos below *Fort Sumner* on the west side for a distance of 50 miles. The *Yeso* carries a small body of water of not more than 2 or 3 second-feet.

Various arroyos, creeks, and springs of alkaline water flow into the Pecos between the *Yeso* and the *Springer River* at *Roswell*, and these few carrying mere threads of water.

On this portion of the river irrigation is principally confined to the *Gaillinas*, *Tecolote*, and *Upper Pecos*. On the *Gaillinas* the major portion of the irrigated land lies between the *Hot Springs* and *Pecos Creek*, a small branch entering from the north about 3 miles below *Las Vegas*.

All the ditches are either private or community with one exception, that being a small ditch leaving the river in the vicinity of the *Hot Springs* and having a length of 3 miles. This ditch was incorporated and built about 1890. The land in cultivation under the community and individual ditches within these limits is about 2,500 acres, with 400 acres under the corporation ditch. Along the lower portion of the stream all ditches are community, and the irrigation is divided as follows:

	Acres.
Los Villas	200
Concepcion	200
La Lindera	400
Los Torros	200
Chaperito	600
Gaillinas Springs to mouth of river	300
Total	1,900

or a total of 4,800 acres along the *Gaillinas River*. The water supply is entirely in use, and no increase in the irrigated acreage is possible excepting along the upper portion in the vicinity of *Las Vegas*. Here freshets occur during June, July, and August, and the conservation of these waters is the only possible solution of the problem.

The *Tecolote* lies between *Gaillinas* and the *Pecos*, and is unimportant, there being but a small flow even in its upper portion. But 200 acres are irrigated along this stream, and this is not susceptible of increase.

Along the head waters of the *Pecos* irrigation is practiced to a considerable extent, there being about 4,000 acres in cultivation above the town of *La Cuesta* at the head of the canyon. From the mouth of the canyon, a short distance above *Anton Chico* to *La Junta*, the junction of the *Gaillinas*, 1,700 acres are under irrigation, while from *La Junta* to a point about 5 miles below *Las Colonias* the acreage is 500 acres. By the end of August the water falls in the river at this point and there is little, if any, until the following April.

About 5 miles below *Las Colonias* the canyon walls come close together, and there is no irrigable land for 15 miles or until *Agua Negra Chiquita* is reached. Here the valley broadens out again to a width varying from a half mile to 2 miles or more.

Near *Eden* there is a large spring from which two ditches are taken, irrigating 100 acres. On the west side of the *Pecos* there is a ditch taking water from the *Agua Negra Chiquita* and irrigating 700 acres.

At this point the entire flow of the *Pecos* is in use and great scarcity is felt during the irrigation season. *Puerta de Luna* practically marks the limit of irrigation down the river, there being but little between there and *Roswell*. There is an occasional small patch irrigated by a spring or private ditch, but not more than 200 acres are cultivated on this portion of the river.

The Pecos in the vicinity of Roswell has discharged during the irrigation season of from 150 to 20,000 second-feet, the latter amount being due to floods occurring during June, July, and August. During the nonirrigation season the flow averages about 200 second-feet. There are six important sources of water supply augmenting the flow of the Pecos at this point. They are the Rio Hondo, the Berenda rivers, north, middle, and south, and the Spring rivers, north and south.

The Rio Hondo has its source in the White Mountains in Lincoln County, and is exceedingly variable in character, the flow ranging from 0 to 1,000 second-feet in time of floods, although perennial in the upper course. During the nonirrigation season the flow in the vicinity of Roswell is about 100 second-feet. The water being wholly appropriated along its head waters, no flow is found along the lower reaches of the stream excepting during times of flood.

The Berenda and Spring rivers all have their sources in small ponds supplied by perennial springs and located in the midst of a prairie within a few miles of each other. Their flow is constant, there being scarcely any variation during the year. Both the Berenda rivers and Spring River, north, empty into the Hondo before reaching the Pecos, but Spring River, south, flows directly into the Pecos.

The discharge of these streams is as follows:

	Second feet.
Berenda, north	7
Berenda, south	18
Berenda, middle	10
Spring, north	60
Spring, south	50

On the Pecos in Chavez County there are no operated ditches, all the flow being appropriated by the Pecos Irrigation and Improvement Company in Eddy County.

On the Rio Hondo there are eleven canals, but four of these, namely, the Overton, the Edwards, the Barnett, all individual ditches, and the Lincoln County community ditch, are not operated. Of the balance, the Cockrell irrigates 60 acres and the Sol. Jacobs 100 acres, both being individual ditches. The community ditches and the acreage irrigated under them are the Perry Fountain, 250 acres, and the Hondo Falls, 40 acres. Corporate ditches are Long and Truxton, irrigating 180 acres; Lea Cockrell, 80 acres, and the Pecos Irrigation and Improvement Canal, 4,000 acres.

From the Berenda River, north, one ditch is taken out (the Pat Boone), irrigating 70 acres. From the Berenda, middle, three ditches are taken out—the Milne-Busch, irrigating 150 acres; the Cosmo Sedillo, irrigating 30 acres, and the J. Bowman, which is not operated. On the Berenda, south, there are three ditches—the Busch-Milne and the Thompson, both individual ditches and irrigating 160 acres, respectively, and the Last Chance community ditch, serving 220 acres.

The Spring River, north, supplies six ditches; the Griff Cunningham (individual) irrigating 60 acres; the Pioneer (community) irrigating 330 acres; the Stone or Eureka, the Lee-Cunningham, the Pierce, Cunningham and Ballard, and the Cap. Lea (all being corporate ditches), irrigating, respectively, 650, 600, 230, and 60 acres.

Spring River, south, also serves six ditches. The Woodlawn and the Pumpkin Row are corporate, and irrigate 540 and 1,200 acres, respectively. The other four are community ditches; of these the Chisum irrigates 1,060 acres; the Texas, 500 acres; the Miller, 250 acres; while the Harris is not operated. The total acreage irrigated being 10,820 acres.

Irrigation on the Pecos below Roswell is confined to the system of the Pecos Irrigation and Improvement Company. This system is one of the largest in the United States, and consists of a series of three storage reservoirs of a combined capacity of about 110,000 acre-feet, supplying canals on either side of the river. It is stated that there are 200,000 acres of land under the canals served by this system, but only a portion of this acreage (12,500) is in cultivation.

There are six tributaries of the Pecos in this section. Below Roswell the first stream of importance is the Rio Felix, which rises among the southeastern foothills of the White Mountains and after a few miles sinks and does not again appear until within 4 miles of its mouth, a distance of 25 miles, where it appears again in a series of springs.

The Penasco takes its rise in the Sacramento Mountains, and formerly flowed 40 miles as a fair-sized brook, then, entering a strip of marshy land 10 to 12 miles long, it disappears. There was practically no connection between the upper and lower Penasco, the latter commencing in a series of springs about 12 miles from the Pecos. Its flow in the upper portion is permanent in Lincoln County, the surplus sinking in the sands below Hope. In Eddy County springs rising in its bed supply a mean flow of 8 second-feet, while during floods it reaches a maximum of about 12,700 second-feet. The entire normal flow is consumed during irrigation season.

The Seven Rivers rise in small springs in Eddy County. The combined normal flow is about 20 second-feet, but reaches a maximum of 7,500 second-feet during the rainy



FOUR-YEAR-OLD APPLE TREE, PECOS VALLEY.

season. There is a surplus of about 5 second-feet from this stream which is lost in seepage.

Rocky Arroyo rises in the Guadalupe Mountains and is permanent in its upper portion, but sinks in the gravel below. Its normal flow is about 10 second-feet, with a flood flow of 1,200 second-feet. Practically all the water is consumed in irrigation, but there is a small surplus which is susceptible of use. In Dark Canyon the same conditions are met, but its normal flow is only about 5 second-feet, while its flood flow reaches 14,000 second-feet. All the water is consumed.

Black River drains a portion of the eastern slope of the Guadalupe Mountains. This river is about 35 miles long, but is a small stream to within 16 miles of the Pecos, where its volume is considerably increased by numerous springs. It flows through a series of lakes and is subject to extensive floods on account of the large area drained. Its normal flow is about 20 second-feet, while in floods it reaches a maximum of 15,000 second-feet. Only about one-half the normal flow is in use on this stream.

The entire absence of tributaries on the eastern side of the Pecos is very striking, and is due, no doubt, to the pervious character of the soil of the Staked Plains, upon which no drainage system is established. The only supply of water which the Pecos receives from this side comes from a few small alkaline springs, or from a small arroyo, which carries water once or twice in a season.

The constant never-failing supply of water in the Pecos comes from springs which must receive their supply from a great distance. This is owing to the peculiar structure of the country, and the prevalence of the easily dissolved limestones, which allow the waters to make underground channels for themselves, and thus flow for considerable distance out of sight.

Reservoir sites are to be found on the Pecos and all these tributaries, and it is probable that 70,000 acres in Eddy County could be irrigated by utilizing these sites even without storage; 20,000 acres more than the present acreage can be irrigated.

In the western portion of the lower Pecos district are located the White, Sacramento, and Guadalupe mountains, in which rise many small streams, those on the eastern slopes flowing toward the Pecos, but nearly all disappearing in the sands a short distance from their source. The same is true of the few streams rising on the western slopes; they disappear and form a part of what is called the Lost River district.

The irrigated lands are found for the most part along the Cienega del Macho, Rio Ruidoso, Rio Bonito, and the upper portions of Rio Jelia Pensaco, Sacramento, and Pinos Creek, heading on the east side of the divide, and Nogal Creek, Three Rivers, Rio Tulerosa and Lost River on its western face. Farmers have settled along the upper portions of these streams and have diverted the water by small ditches, bringing under cultivation a small part of the arable land. Along the head waters of these creeks there appears to be an ample supply of water.

The total irrigated acreage of this section is about 18,500 acres, of which 4,000 acres are located on the Penasco above Hope and 750 below, 500 on the Upper Rio Felix and 250 on the lower Black River.

The acreage irrigated on these two streams can be increased 100 per cent, as only about one-half the flow is utilized.

Only a thorough investigation can determine the possibilities of the other portions of this section. The total acreage irrigated in this district is as follows:

	Acre.
Pecos above Roswell.....	11,500
Pecos and tributaries in Chavez County.....	10,820
Pecos and tributaries in Eddy County.....	13,500
Western section of Pecos district.....	18,500
Total	54,320

RIO GRANDE.—DISTRICT No. 11.

Geographical location : Extends from north to south through the center portion of the Territory. Acreage irrigated, 80,600.

The sources of the Rio Grande are in the Rocky Mountains of Colorado. It receives a large number of tributaries along its upper course and enters the San Luis Valley as a large stream, where it is further augmented by the drainage from the Sangre de Cristo Mountains.

At the lower end of the valley the river has cut its way through the lava dam and now flows through a canyon which is about 100 feet deep at the Colorado line, but deepens to about 700 feet at the mouth of the Rio Hondo, and holds this depth within a short distance above Embudo.

No living water enters this canyon from the west, but several good streams bring water from the east, notably the Costilla, Colorado, Rio Hondo, Taos, and Embudo, all of which rise in the Costilla and Taos Mountains. These streams are perennial, and all of them discharge large quantities of water to the Rio Grande, augmenting its

flow greatly. The fall of the river is about 30 feet per mile between the Colorado line and Embudo.

There is no arable land along this portion of the river excepting in the vicinity of Rinconada and immediately above Embudo, the acreage irrigated from water diverted from the Rio Grande being about 700 acres.

About 3 miles below Embudo the walls of the canyon fall away abruptly and the river enters the Espanola Valley, which extends to White Rock Canyon some 25 miles below. In this valley it receives the waters of the Santa Cruz and Nambé from the east and of the Chama from the west.

The Santa Cruz and Chama, especially the latter, are streams of great importance, and contribute more largely to the flow of the Rio Grande than any other. They are perennial.

Below the Chama the Rio Grande assumes a different character; the fall becomes less, the velocity is diminished, and sediment deposited forming a bottom of sand and silt with shifting banks. The Chama brings down vast quantities of silt also, and from this point south the river is muddy in the extreme.

Irrigation is confined wholly to the bottom lands along the river, practically all these lands being under ditch. The irrigated acreage in the valley between Embudo and White Rock Canyon is 13,200 acres, made up as follows:

	Acres.
From water diverted from the Rio Grande	6,000
From water diverted from the Chama	4,500
From water diverted from the Santa Cruz	1,600
From water diverted from the Nambé	600
From water diverted from the Santa Clara	500
Total	13,200

In this section the water supply of the Rio Grande is always good.

After passing through White Rock Canyon, which is a narrow gorge, some 20 miles long, with precipitous walls some 500 feet high, the river enters the Albuquerque Valley of the Rio Grande, which extends south to San Marcial. This valley is narrow, at no place being more than 3 miles wide, while at many points the side hills approach each other so closely that there are no bottom lands.

Around Bernalillo, Albuquerque, Belen, and from Los Lunas, south, are large areas of cultivated lands. In the vicinity of Bernalillo, Alameda, and especially between Los Lunas and Belen, are large alkali flats, once productive fields, but now worthless from lack of drainage, without which it is doubtful if much further cultivation can be accomplished.

From San Felipe to San Marcial the river occupies a broad, sandy bed, dividing in low stages into a number of narrow, crooked channels, but in flood covering in many places nearly half the valley. The loss from seepage and evaporation in the river from San Felipe south is very great and is responsible for much of the shortage of water felt in the lower river during the irrigation season.

All along the river there is much waste bottom land, a portion of which above Los Lunas raises a scanty supply of coarse grass for grazing purposes. Below Los Lunas a large part of the land is covered with cottonwood thickets. Where these are cut away the land is found to be of excellent quality.

There are no perennial tributaries entering the Rio Grande in this section. The Santa Fe, Gallisteo and Tijeras enter from the east, the first delivering water to the river during the early spring and in time of floods; the last two only in time of floods.

From the west, the river receives the drainage from the Jemez, Puerco, and Salado. The Jemez and Puerco deliver water during the early spring and in flood times; especially the latter, which has a flood discharge of about 32,000 second-feet, as measured near Rocky Ford.

The Salado flows only in time of floods.

Not over one-fourth of the bottom lands in the Albuquerque Valley is under ditch and of this only a small portion is in cultivation. The land irrigated in this section between Cochiti and San Marcial is about 22,500 acres.

All the ditches serving this land are individual and community ditches of the most primitive construction. A statement of the land served under each ditch is an impossibility, as lands lying under one ditch may be, and many times are, served from a higher one. However, there are about seventy ditches within the limits of the Albuquerque Valley, and the average acreage served is 320 acres.

The water supply of this valley is ample in the upper part, but has failed below Bernalillo in times of great drought. Failures occur more frequently below Ysleta, and from Acacia south the supply after the middle of July is precarious in times of subnormal rainfall.

After leaving the Albuquerque Valley, for some miles below San Marcial, the river flows through a comparatively narrow bottom, which is not more than one-fourth of a mile wide and is bordered in places by steep rocky bluffs, these disappearing farther down the river. Ten miles below San Marcial the bottom lands nearly or quite disappear, and on the left side the Fra Cristobal Mountains rise abruptly from the water's edge, while on the right or west side the ground rises gradually from the river's bank to the foothills. The river channel continues of this character to a point below the little Mexican town of San Jose, where, after contracting, the valley opens again to a width of about half a mile and, abruptly contracting again, the river enters a canyon.

This canyon extends for about 6 miles, and varies in width from 500 to 1,500 feet at the high-water mark. The walls of the canyon are of gravel and conglomerate, overlaid by lava, which in some places, particularly on the left bank, reaches a thickness of 40 feet. The walls at the highest part are about 100 feet high, decreasing to 50 or 60 feet in places, and are cut by arroyos.

Below this gorge the river again widens and there are patches of irrigable land; but the river bottom itself is narrow and the river bed, being nearly half a mile in width, occupies nearly all of the narrow valley.

These alternations of narrow gorges and bottom lands continue nearly to Fort Selden. In this course are points at which the river bottom lands are between 5 and 6 miles in width, and are covered for the most part with a dense growth of mesquite and cottonwood.

As in the case of the Albuquerque Valley, but little of the bottom land is in cultivation, the acreage irrigated being about 7,000 acres.

There are two reservoir sites between San Marcial and Rincon. The Rio Grande Dam and Irrigation Company has been organized with the object of improving the site at Elephant Butte and irrigating the lands below. It is proposed to build at this point a dam 96 feet high, impounding 250,000 acre-feet of water, and irrigating not only the Mesilla Valley but also the valleys of Lomo Pardo, Colorado, and Rincon above. It is only through the construction of such systems of storage and by the utilization of the underground waters that the central and southern portion of the Rio Grande Valley in New Mexico may hope to save themselves from the disastrous effects of drought, and bring under cultivation the great acreage of waste land now idle.

Below Fort Selden the valley opens, and continues in general broad and fertile down to the constriction at El Paso. In this course is the Mesilla Valley, one of the best localities for fruit growing along the Rio Grande. This valley, stretching from Fort Selden Reservation on the north to the Texas line on the south, a distance of about 35 miles, and with a width varying from 8 to 10 miles, includes land equal to any in the United States. The soil is of wonderful fertility and great depth, but agriculture has made but slow progress, owing to the uncertainty of the water supply, which may fail after July 1.

The acreage irrigated in the Mesilla Valley within the Territory of New Mexico is about 22,000 acres, and no further increase may be looked for without storage or the utilization of the underground waters.

The question of water supply is attracting more and more attention each year, and has become of vital importance to all below Albuquerque. It has of late been made the subject of diplomatic correspondence between the United States and Mexico.

The only data available in a study of this important subject is that collected by the division of hydrography of the United States Geological Survey, which since 1889 has been studying this subject. Gauging stations have been maintained along the river and frequent measurements made, from which has been calculated the discharge of the river at the several points.

The most northerly of these stations is at Del Norte, Colo. I give herewith a table of discharge showing the maximum, minimum, and mean flow, and total for the month, during the years a record may be had.

Discharge of Rio Grande at Del Norte, Colo.

[Drainage area, 1,400 square miles.]

Month.	Maximum.	Minimum.	Mean.	Total for month.
1889.				
October 11 to 31.....	<i>Second-feet.</i> 345	<i>Second-feet.</i> 214	<i>Second-feet.</i> 278	<i>Acre-feet.</i> 17,097
November.....	364	290	319	18,980
December.....	364	200	281	17,281
1890.				
January.....	1,000	326	552	33,948
February.....	896	745	796	44,178
March.....	842	404	487	29,950
April.....	1,380	404	913	54,323
May.....	5,930	1,990	4,331	266,356
June.....	5,555	2,550	3,807	226,516
July.....	2,260	862	1,515	93,172
August.....	930	450	612	37,638
September.....	450	326	383	22,788
October.....	862	307	470	28,905
November.....	610	345	478	28,441
December.....	670	475	565	34,747
Per annum.....	5,930	307	1,242	900,962
1891.				
January.....	1,320	670	990	60,885
February.....	1,410	1,196	1,294	71,917
March.....	1,400	930	1,290	78,720
April.....	3,160	796	1,410	83,895
May.....	5,650	1,860	3,245	202,027
June.....	5,555	2,190	4,146	246,687
July.....	3,565	862	1,693	104,119
August.....	1,400	404	663	40,774
September.....	1,234	290	527	31,356
October.....	2,475	450	844	51,906
November.....	450	303	374	22,253
December.....	.....	a 325	a 325	19,987
Per annum.....	5,650	290	1,403	1,014,426
1892.				
January.....	.....	.....	a 300	18,450
February.....	.....	.....	a 300	17,250
March 22 to 31.....	345	290	316	19,434
April.....	2,400	345	1,047	62,296
May.....	4,710	1,510	2,005	160,207
June.....	3,160	1,152	2,187	130,126
July.....	1,074	554	740	45,510
August.....	610	308	444	27,306
September.....	308	243	262	15,589
October.....	290	243	259	15,928
November.....	629	243	360	21,420
December.....	1,074	862	922	56,703
Per annum.....	4,710	243	812	500,219
1893.				
January.....	1,113	862	966	59,409
February.....	.....	.....	a 700	38,650
March.....	.....	.....	a 500	30,750
April.....	1,037	326	533	31,714
May.....	3,320	732	1,944	119,556
June.....	2,850	670	1,749	104,666
July.....	640	290	395	24,292
August.....	450	258	324	19,926
September.....	345	228	270	16,065
October.....	308	243	283	16,175
November.....	450	214	278	16,600
December.....	862	228	642	39,483
Per annum.....	3,320	214	714	516,886
1894.				
January.....	1,870	1,080	1,213	75,200
February.....	1,260	1,120	1,200	67,300
March.....	1,370	550	1,015	62,830
April.....	2,010	.....	860	51,600
May.....	4,560	1,310	2,510	155,620

a Estimated.

Discharge of Rio Grande at Del Norte, Colo.—Continued.

Month.	Maximum.	Minimum.	Mean.	Total for month.
1894—Continued.				
June.....	<i>Second-feet.</i> 1,840	<i>Second-feet.</i> 450	<i>Second-feet.</i> 960	<i>Acre-feet.</i> 58,800
July.....	490	300	355	22,010
August.....	550	300	380	23,560
September.....	490	280	345	20,600
October.....	450	300	345	21,390
November.....	300	235	270	16,200
December.....	240	665	360	22,330
Per annum.....	4,560	235	818	597,440
1895.				
January.....	894	680	801	49,252
February.....	1,061	894	953	52,927
March.....	960	403	638	39,229
April.....	3,129	650	1,883	112,047
May.....	3,129	1,382	2,116	130,108
June.....	3,804	1,172	2,209	131,445
July.....	1,252	770	958	58,905
August.....	960	566	720	44,271
September.....	566	376	454	27,015
October.....	484	403	435	26,747
November.....	403	322	353	21,005
December.....	1,212	403	1,068	61,980
Per annum.....	3,804	322	1,044	754,931
1896.				
January.....	1,428	1,172	1,293	79,504
February.....	2,154	960	1,258	72,361
March.....	1,386	830	1,081	66,469
April.....	3,054	594	1,484	88,304
May.....	3,579	1,212	2,374	145,978
June.....	1,766	430	821	48,853
July.....	650	322	403	24,780
August.....	703	214	261	16,048
September.....	1,294	268	477	28,383
October.....	566	403	469	28,838
November.....	376	268	310	18,446
December.....	430	322	375	23,058
Per annum.....	3,579	214	884	641,017
1897.				
January.....	1,120	465	911	56,480
February.....	1,275	1,150	1,200	33,852
March.....	1,375	590	856	53,072
April.....	1,800	530	1,023	61,380
May.....	5,250	1,720	3,538	219,356
June.....	4,870	1,580	3,289	197,940
July.....	2,140	565	1,064	67,828
August.....	630	300	457	28,354
September.....	990	290	635	38,100
October.....	2,100	810	1,371	85,002
November.....	890	540	680	41,160
December.....	1,280	750	1,036	64,232
Per annum.....	5,250	290	1,343	946,736

Three stations have been maintained in New Mexico; at Embudo, Rio Grande, and San Marcial.

The Embudo station is important, inasmuch as it furnishes the record of the flow of the Rio Grande before the diversion of its waters in New Mexico. I herewith give tables of discharge showing this flow.

Discharge of Rio Grande at Embudo, N. Mex.

[Drainage area, 7,000 square miles.]

Month.	Maximum.	Minimum.	Mean.	Total for month.
1889.	<i>Second-feet.</i>	<i>Second-feet.</i>	<i>Second-feet.</i>	<i>Acres-feet.</i>
January	495	379	431	26,506
February	576	420	473	28,251
March	1,042	537	784	48,216
April	4,420	970	2,261	134,590
May	5,075	2,448	3,430	210,945
June	5,660	1,890	2,922	173,859
July	1,105	286	471	28,966
August	253	181	206	12,669
September	264	184	212	12,614
October	324	243	283	17,404
November	507	253	366	21,777
December	610	364	542	33,338
Per annum	5,660	181	1,032	747,070
1890.				
January	617	260	437	26,875
February	670	344	553	30,691
March	1,044	830	962	41,943
April	3,220	842	2,083	123,938
May	6,071	2,660	4,960	305,040
June	5,740	2,768	4,107	244,366
July	2,640	970	1,593	97,969
August	1,134	636	814	50,061
September	1,044	496	545	32,427
October	606	523	562	34,563
November	699	550	616	36,653
December	660	636	648	39,852
Per annum	6,071	260	1,467	1,064,377
1891.				
January	666	550	566	36,089
February	1,000	550	616	34,152
March	1,480	735	917	56,395
April	5,690	735	2,870	141,015
May	8,550	4,520	5,965	366,847
June	6,340	4,325	5,040	299,880
July	4,130	1,250	2,356	144,894
August	1,805	820	933	57,379
September	2,025	820	469	27,905
October	3,350	225	1,681	103,381
November	970	515	778	46,291
December	880	340	563	34,009
Per annum	8,550	225	1,855	1,348,217
1892.				
January	615	440	497	30,565
February	700	490	596	34,270
March	1,550	700	1,051	64,636
April	4,910	860	2,979	177,250
May	6,665	4,130	4,890	300,735
June	4,715	1,550	3,146	187,187
July	1,400	280	538	33,087
August	800	152	191	11,746
September	165	140	152	9,044
October	260	165	202	12,423
November	400	243	317	18,861
December	490	165	324	19,926
Per annum	6,665	140	1,240	899,780
1893.				
January	360	280	332	20,418
February	465	340	415	23,083
March	670	390	501	30,813
April	2,465	700	1,436	85,443
May	5,105	1,500	3,119	191,819
June	3,740	540	2,533	150,714
July	1,150	130	296	18,899
August	565	140	280	14,145
September	440	225	287	17,077
October	420	340	363	22,325
November			4450	27,000
December			4445	27,590
Per annum			863	624,374

Discharge of Rio Grande at Embudo, N. Mex.—Continued.

Month.	Maximum.	Minimum.	Mean.	Total for month.
1894.	<i>Second-feet.</i>	<i>Second-feet.</i>	<i>Second-feet.</i>	<i>Acre-feet.</i>
January			435	28,970
February			450	25,200
March			a 500	31,000
April				
May				
June				
July				
August				
September			155	9,300
October			229	14,198
November			340	20,400
December			338	20,956
Per annum				
1895.				
January	552	432	475	29,207
February	672	420	503	27,935
March	1,410	640	759	46,546
April	4,290	592	2,541	151,200
May	4,290	1,573	2,679	164,725
June	4,985	790	3,021	179,762
July	2,530	612	1,335	82,096
August	2,016	652	1,080	66,407
September	1,146	480	636	37,845
October	572	460	494	30,375
November	700	540	611	36,357
December	580	420	534	32,834
Per annum	4,985	420	1,222	885,279
1896.				
January	660	460	532	32,712
February	640	480	551	31,094
March	2,100	580	957	58,844
April	2,720	1,200	1,797	106,929
May	2,980	850	1,598	98,259
June	990	210	367	21,838
July	1,380	210	299	18,385
August	310	210	249	15,310
September	580	210	228	13,570
October	1,090	275	849	21,459
November	660	210	395	23,504
December	500	380	414	25,456
Per annum	2,980	210	645	467,960
1897.				
January	410	375	384	23,826
February	475	375	407	22,832
March	865	410	561	34,784
April	3,178	700	1,691	101,434
May	8,745	3,178	5,443	337,450
June	7,600	2,270	4,596	275,788
July	1,925	345	1,248	77,268
August	1,015	285	338	20,970
September	460	285	344	20,660
October	2,150	495	1,535	95,150
November	1,435	745	1,137	68,200
December	745	415	548	33,960
Per annum	8,745	285	1,519	1,112,382

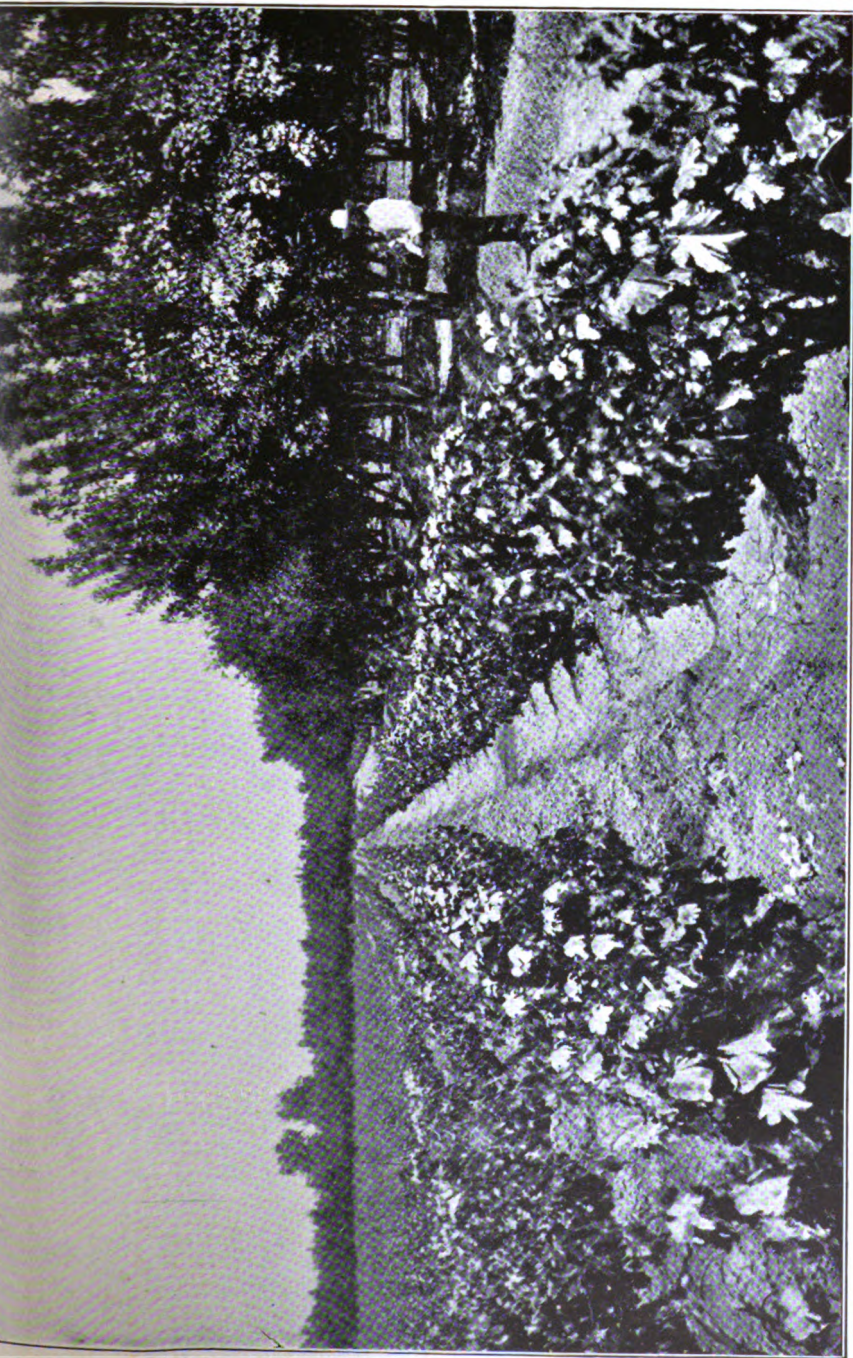
a Estimated.

The Rio Grande station is located at the upper end of White Rock Canyon, and is the most important in New Mexico. It was established in February, 1895, and shows the great influence on the flow of the Rio Grande of the Chama, the Santa Cruz, Nambé, and other streams entering the river in its passage through the Espanola Valley. Its record is as follows:

Discharge of Rio Grande at Rio Grande, N. Mex.

Month.	Maximum.	Minimum.	Mean.	Total for month.
1895.				
	<i>Second-feet.</i>	<i>Second-feet.</i>	<i>Second-feet.</i>	<i>Acres-feet.</i>
January				a 34,463
February	1,440	355	591	32,822
March	2,640	730	1,371	84,294
April	8,630	1,610	5,073	301,864
May	6,055	2,420	4,616	283,827
June	7,200	1,120	4,630	275,504
July	4,430	1,005	1,768	108,710
August	2,490	705	1,481	91,063
September	1,160	530	723	43,021
October	880	630	707	43,473
November	940	655	834	49,626
December	855	605	713	43,841
Per annum	8,630	855	2,046	1,392,507
1896.				
January			a 600	36,893
February			a 600	34,512
March 4 to 31	3,015	675	1,355	75,264
April	5,140	1,810	3,483	207,253
May	5,250	1,265	2,704	166,263
June	1,680	255	535	31,835
July	920	255	412	25,338
August	310	210	243	14,942
September	735	255	299	17,792
October	617	350	461	28,846
November	617	310	498	29,638
December	645	330	488	30,006
Per annum	5,250	210	973	698,072
1897.				
January	570	300	472	25,280
February	590	470	541	30,320
March	2,485	610	985	61,480
April	9,220	1,200	5,056	303,350
May	15,340	8,500	11,454	710,120
June	10,900	2,480	6,153	369,180
July	3,190	200	1,580	98,180
August	1,255	240	458	28,380
September	2,360	360	650	38,960
October	3,465	780	2,227	138,080
November	1,710	680	1,208	72,480
December	745	350	536	33,230
Per annum	15,340	200	2,610	1,908,060

a Estimated.



SCENE IN LOWER RIO GRANDE VALLEY.

The station at San Marcial has been maintained since 1895, but owing to the shifting bottom results have been obtained with difficulty. This station demonstrates the influence of the flood-water flow on the discharge of the Rio Grande, there being no permanent streams entering the river between Rio Grande Station and San Marcial, and the spring flow, where there is any, being very small. In 1895 the record covers only the months from February to August.

Estimated monthly discharge of Rio Grande at San Marcial, N. Mex.

[Drainage area, 28,067 square miles.]

Month.	Maximum.	Minimum.	Mean.	Total for month.
1895.				
	<i>Second-feet.</i>	<i>Second-feet.</i>	<i>Second-feet.</i>	<i>Acres-feet.</i>
February	1,755	280	986	53,780
March	3,115	1,350	2,096	128,879
April	7,800	2,180	4,689	279,014
May	6,265	2,095	3,625	223,892
June	5,958	1,080	3,922	233,375
July	7,339	960	2,431	149,476
August	6,265	1,210	2,913	179,113
	7,800	280	2,962	1,246,509
1896.				
January				^a 25,000
February	685	580	680	39,144
March	2,200	240	679	41,750
April	4,800	1,400	3,142	186,902
May	4,800	195	2,019	124,143
June	820	0	164	9,759
July	4,800	0	466	28,653
August	820	0	118	7,255
September	1,500	0	130	7,735
October	11,300	0	742	45,624
November	496	15	209	12,444
December	820	460	619	33,080
Per annum	11,300	0	815	506,409
1897.				
January	600	200	318	19,694
February	600	350	434	24,350
March	1,350	350	680	40,950
April	7,025	900	3,584	315,050
May	22,250	6,150	12,173	754,700
June	11,112	1,775	6,156	369,352
July	2,025	270	1,117	69,250
August	365	5	101	6,230
September	6,050	5	1,907	114,412
October	15,500	650	4,619	283,400
November	3,500	2,100	2,953	177,200
December	3,100	2,400	2,484	154,000
Per annum	22,250	5	3,042	2,331,586

^a Estimated.

At El Paso, Tex., the river has been gauged at varying periods, but unfortunately the record is not continuous. This station is of as much or more importance than any of the others, as the data obtained here will be of the greatest importance in the adjustment of the conflicting water rights claimed by New Mexico, Texas, and the Republic of Mexico.

I present herewith all the data available on this subject.

Discharge of the Rio Grande at El Paso, Tex.

[Drainage area, 30,000 square miles.]

Month.	Maximum.	Minimum.	Mean.	Total for month.
1889.				
May 10 to 31.....	<i>Second-feet.</i> 4,705	<i>Second-feet.</i> 2,060	<i>Second-feet.</i> 3,116	<i>Acres-feet.</i> 181,634
June.....	4,460	660	2,638	150,961
July.....	930	0	237	14,575
August.....	0	0	0	0
September.....	0	0	0	0
October.....	0	0	0	0
November.....	0	0	0	0
December.....	252	0	71	4,366
1890.				
January.....	280	126	196	12,054
February.....	458	108	290	16,065
March.....	1,140	45	424	26,076
April.....	4,108	470	2,190	130,305
May.....	7,200	3,495	5,771	354,916
June.....	7,200	2,925	4,404	262,038
July.....	2,355	235	854	52,531
August.....	2,497	170	734	45,141
September.....	660	40	176	10,472
October.....	116	40	65	3,967
November.....	610	40	234	16,896
December.....	610	480	535	32,902
Per annum.....	7,200	40	1,327	963,415
1891.				
January.....	715	140	451	27,736
February.....	2,640	470	809	44,890
March.....	4,635	470	1,866	114,750
April.....	8,625	1,040	4,265	253,767
May.....	16,620	8,340	11,852	723,528
June.....	8,340	5,045	6,714	399,483
July.....	6,345	610	2,271	139,696
August.....	1,785	17	662	40,713
September.....	9,480	0	768	45,665
October.....	8,535	560	1,488	91,512
November.....	515	235	341	20,290
December.....	560	190	344	21,156
Per annum.....	16,620	0	2,653	1,926,303
1892.				
January.....	470	155	326	20,049
February.....	830	290	476	27,370
March.....	2,070	890	752	46,248
April.....	7,485	470	3,147	187,246
May.....	10,050	5,205	7,063	436,219
June.....	6,484	500	2,943	175,108
July.....	2,500	0	668	41,062
August.....	140	0	13	800
September.....	0	0	0	0
October.....	0	0	0	0
November.....	0	0	0	0
December.....	0	0	0	0
Per annum.....	10,050	0	1,285	934,123
1897.				
January.....	1,260	90	305	13,753
February.....	230	125	194	10,774
March.....	120	80	72	4,427
April.....	4,225	40	1,740	103,537
May.....	17,000	5,000	8,312	511,065
June.....	11,000	2,000	6,065	382,678
July.....	5,300	300	1,330	61,778

Discharge of the Rio Grande at El Paso, Tex.—Continued.

Month.	Maximum.	Minimum.	Mean.	Total for month.
1897.				
	<i>Second-feet.</i>	<i>Second-feet.</i>	<i>Second-feet.</i>	<i>Acres-feet.</i>
August.....	600	0	132	8,117
September.....	2,880	0	705	41,960
October.....	5,000	230	1,758	108,095
November.....	1,696	810	1,132	67,358
December.....	1,015	460	680	41,812
Per annum.....	17,000	00	1,871	1,860,874

SUMMARY.

Year.	Del Norte.	Per cent of gain or loss.	Embudo.	Per cent of gain or loss.	Rio Grande.	Per cent of gain or loss.	San Marcial.	Per cent of gain or loss.	El Paso.
1899.....			747,070						
1890.....	900,962	+18	1,064,377					-08	963,415
1891.....	1,014,426	+32	1,348,217					+42	1,926,203
1892.....	590,219	+52	899,730					+03	934,122
1893.....	516,886	+20	624,274						
1894.....	597,440								
1895.....	754,931	+17	885,279	+57	1,392,507				
1896.....	641,017	-27	467,960	+47	698,072	-19	566,499		
1897.....	946,737	+17	1,112,382	+71	1,909,060	+22	2,331,598	-41	1,860,874

The question of the water supply of the Rio Grande is one of the most important subjects in New Mexico to-day, and deserving the most careful attention, but owing to the very limited time allowed me by the commission for the completion of this report, I am unable to digest and discuss the above data. A few ideas, however, have crystalized in the compiling of the data, and I present them herewith. Only a thorough study of the subject can determine whether they are justified or not.

The great draft of water for irrigation purposes from the headwaters of the Rio Grande in Colorado does not apparently lessen the flow in New Mexico as greatly as has been supposed, and is not responsible for the great scarcity of water of late years in the lower Rio Grande Valleys.

The flow of the Rio Grande in New Mexico is dependent upon the precipitation and run-off from the catchment areas of New Mexico rather than from those of Colorado. A period of subnormal precipitation upon the New Mexico watershed may not reach its maximum effect upon the stream flow for a considerable period of time.

The losses from seepage are much greater than generally supposed. I have obtained several measurements of the flow at San Marcial and El Paso during the years 1895, 1896, and 1897, which tend to support this proposition, but they are too fragmentary to base definite conclusions upon.

I submit them herewith:

Date.	Locality.	Discharge in second- feet.	Date.	Locality.	Discharge in second- feet.
1895.			1896.		
Nov. 17	San Marcial.....	674	Jan. 22	San Marcial.....	767
20	El Paso.....	392	25	El Paso.....	390
	Loss.....	282		Loss.....	377
Dec. 24	San Marcial.....	602	Feb. 14	San Marcial.....	570
27	El Paso.....	280	17	El Paso.....	340
	Loss.....	322		Loss.....	230
1896.			1897.		
Jan. 10	San Marcial.....	701	21	San Marcial.....	344
13	El Paso.....	390	24	El Paso.....	175
	Loss.....	311		Loss.....	169

or an average of about 2.8 second-feet per mile.

In January, 1898, I took measurements of the Rio Grande at Albuquerque and Corrales, the flow being about 1,000 second-feet at the time, and found a loss of 20 second-feet in a distance of 8 miles, or 2.5 second-feet per mile. In all the above measurements there was no diversion whatever of water from the river between the points mentioned.

I have been unable to find any indication of return waters excepting along the headwaters of some of the minor streams.

These seepage losses occur generally throughout New Mexico, and indicate that the higher up the stream the water is diverted the greater the acreage that can be irrigated. New Mexico has great areas of land which will be ultimately irrigated from underground waters. The valleys of the Pecos, Rio Grande, and the Florida plains, as well as other districts, are underlaid with great bodies of water, and this subject should be carefully investigated, as no data is at present available on the subject.

I would suggest that steps be taken toward the creation of the office of Territorial engineer, that these subjects, which are of such vital importance to the Territory at large and so necessary to its advancement, may receive the attention and investigation so greatly needed.

In closing, I wish to acknowledge the great assistance I have received from the many who have so kindly replied to my inquiries, and especially to Mr. W. M. Reed, engineer of the Pecos Irrigation and Improvement Company; Mr. L. S. Preston, engineer of the Maxwell Land Grant Company; to Mr. F. H. Newell, of the United States Geological Survey; and to the reports of the division of hydrography. I have in many instances quoted from the latter freely, and from other papers as well.

Very respectfully,

P. E. HARROUN,
Civil Engineer.

ALBUQUERQUE, N. MEX., *September 29, 1898.*

THE CANADIAN RIVER SECTION.

This agricultural district lies between the Raton Mountains on the north and the Pecos River on the southwest. The Canadian flows through it for about 150 miles in a southeasterly direction to near old Fort Bascom, and from there easterly (a little north of the thirty-fifth parallel of north latitude) for about 50 miles. Most of its tributaries flow in from the west. As the western part of this entire section has a slope toward the east with a general descent to the southward, the highest localities are in the northwest corner and the lowest in the southeast, with a falling altitude of from 5,000 to 3,000 feet. Some portions of this river have a fall of 9 feet per mile. Of its tributaries, the little Cimarron and Vermejo creeks afford considerable breadth of arable land, the former having a valley from 25 to 30 miles long and from 1 to 6 miles wide; and the Vermejo one of the same length and about 2 miles wide. Both of these valleys are very fertile, with plenty of water for irrigation. The Rayado Creek has a good valley, but it is subject to overflows. Ocate Creek Valley, formed by erosion, is also very good agricultural land. The Mora River Valley is doubtless the finest in this section. It has a length of from 60 to 70 miles and a breadth of about $4\frac{1}{2}$ miles. Its upper portion from 8 to 10 miles in length is about 3 miles wide.

GILA AND COLORADO RIVER SECTION.

This section embraces a belt of land of from 50 to 100 miles wide along the whole of the western line of New Mexico. It is watered by the Rio Puerco of the west and the Zuni River in the north, and by the Gila and its many tributaries and the Rio San Francisco in the south. There are rich and extensive valley lands along the bottoms of these rivers, the most fertile being that of the Rio San Francisco.

THE NORTHWEST RIVER SECTION.

The San Juan River country in the northwestern portion of the Territory offers a splendid opportunity, not only for the production of cereals, but also for vegetables and fruits of all kinds. The vine thrives to perfection. The valleys of the Las Animas, La Plata, and Los Linos, all tributaries to the San Juan, are also capable of rendering large amounts of produce. The valley of the Chama River, especially in its upper part from Chama on the Denver and Rio Grande Railway to below Tierra Amarilla, the county seat or Rio Arriba, is one of the finest valleys in the country, and highly productive. And again, the valleys of the tributaries to the Chama, the Brazos, Nutritas, Gallinas, Puerco, El Rito, Ojo Caliente, Bear Creek, and others are all highly susceptible to cultivation. The valley of the Puerco of the east, and the Rio Jemez with its many tributaries, afford fertile lands, already for centuries under cultivation.

ADVANTAGES OF IRRIGATION.

When the Eastern farmer sees all the work entailed in laying out a wheat field for irrigation and the subsequent labor of applying the water, he is often heard to exclaim, "If all that work is necessary, I have no use for irrigation." It is useless to attempt to disguise the fact that irrigation entails much expense in the cultivation of crops. Of course, that expense varies with the kind of crop raised; but the question may be asked whether the value of the extra quantity produced is not in excess of the extra expenditure.

Let us take the case of alfalfa. The yearly expense per acre for irrigation, as has already been shown, is \$2.15; but four crops of hay are raised in the year in lieu of one without irrigation, or say $3\frac{1}{2}$ tons instead of $1\frac{1}{2}$ tons. The farmer therefore gets an extra 2 tons of hay for an expenditure of \$2.15 in water. Add \$2 for the cost of harvesting these 2 tons, and you have an extra 2 tons of hay costing \$4.15, or \$2.08 per ton.

In the case of wheat crop it is not easy to give exact figures, but I have no hesitation in saying that the crop will be double what it is in countries where irrigation is not practiced and where fertilizers are not used. This is due in large part to the fertilizing properties of the river water, to which reference has already been made, which insures the permanent fertility of the soil. One must also bear in mind the fact that wheat and almost all farm products are worth more in the irrigated districts of the West than they are farther east.

No farmer would consider it a waste of money to put 10 tons per acre of barnyard manure upon his land every year, even though it cost him \$6. For half this expense he can, where the river water is of the same quality as that which irrigates the Mesilla Valley, not only apply fertilizers equal to the contents of 10 tons of barnyard manure, but he gives the crop the exact amount of water required for a full yield, insures it against loss by drought, and gets a better price than could be obtained elsewhere. Irrigation farming means intensive farming; and it is intensive farms which pay in the long run.

If the question is asked, as it often is, What is the most profitable product to raise in New Mexico? the answer generally made is that apples, peaches, grapes, or some fancy crop will pay the most money, and dazzling figures are given showing the number of pounds per acre and cents per pound, resulting in a rapid fortune from 40 acres of land.

In my opinion, however, the future of farming in New Mexico does not lie in this direction.

I have elsewhere referred to the feeding qualities of alfalfa, especially when mixed with corn or sorghum fodders and corn meal. The climate, soil, and irrigation of the Mesilla Valley, and of many other valleys on the Rio Grande, are especially adapted to raising these crops, and I believe that the future of farming here lies in feeding alfalfa and corn for the production of beef, pork, and dairy products.

There is an abundance of range cattle, which up to the present time are shipped to Eastern points and there fattened for market, while right here are all the means of fattening these cattle. If the cattle were fattened at home, not only could they be shipped more profitably, but there would be a remunerative market at home.

The advantages of stock feeding over fruit growing are many. In the first place, the stock gives an immediate return, whereas no return can be expected from fruit for four and often six years. Then, again, there are more farmers who understand stock raising than there are who understand fruit raising and fruit growing. Moreover, there are many risks attached to an orchard which are absent from a stock farm, especially in the matter of prices obtainable for the produce. Pork, beef, and butter are always in steady demand, and at cash prices, and the stock farmer is not liable to losses from gluts in the market, which so often beset the orchardist.

MINING AND MINERAL RESOURCES.

The mining resources of New Mexico are something wonderful. Here we have practically everything in the shape of mineral too numerous to mention, but running from salt and sulphur up to gold and silver and precious stones. And while there are numerous paying mines, none of them are what may be said to be well developed so far. All that it needs is the influx of more capital to thoroughly develop its various mines, when this Territory will become one of the richest mineral producing regions of the Rocky Mountain range.

The mineral resources of our Territory have been slowly but surely forcing the attention of capitalists, and the outlook for the coming year is very encouraging and brighter than it has ever been. It has been a hard matter to interest men of means in our mines, but gradually this indifference is wearing off and capitalists are now sending experts to examine into the many promising propositions throughout the Territory, and we hope for good results from the interest taken by our Eastern friends, as New Mexico offers as fine opportunities in the mining line as any portion of the globe. This interesting of capitalists means that money for development, for mining machinery, for smelters, mills, and other reduction plants will find its way to New Mexico and make the mining camps of New Mexico large producers.

GOLD OUTPUT WILL BE ENORMOUS FROM MANY DISTRICTS—EASTERN CAPITAL IS BEGINNING TO DISCOVER THE OPPORTUNITY—NOT ONLY GOLD, BUT OTHER METALS AND PRECIOUS STONES ARE FOUND THERE.

Mining matters in New Mexico can only be spoken of as surprising in every respect, and everywhere from along the line of that industry reports are continually coming in of new strikes being made, old mines being worked to their fullest capacity, and new corporations being formed for the purpose of exploration and practical working. It is being demonstrated every day, and in all of the principal districts, that there is gold, and plenty of it. What is needed now is capital with which to work mines that have been proved more than good paying propositions. In many districts the experimental period is positively passed, and practical work with capital is being

done. Capital is pouring in from the East, and the gold mines of New Mexico are proving vastly more productive of profits than the manufactories of Massachusetts, Ohio, and Illinois, and Eastern men are beginning to realize that such is a fact.

THE MOGOLLON DISTRICT.

Down in the Southern or Mogollon district the activity is very great, and increased capacity is steadily marked. The Confidence is turning out from 80 to 100 tons of ore every day with a force of 70 miners. The ore is of good quality, and the proprietors are enjoying a well deserved period of profits.

The Deadwood mine, in the same district, is now run in connection with the Deep Down mill, which is using daily considerable ore which averages \$16 in gold and \$21 in silver. There are immense bodies of this ore in sight and very easily gotten out. Numbers of smaller mines in the same district are being worked, and prospectors are actively looking up that region and with considerable success. The Philadelphia men who are interested in that section are reported as pushing the formation of their big company, and it is expected their operations will be commenced in the near future, giving numbers of men in that region employment.

THE HILLSBOROUGH OUTPUT.

And at Hillsborough, in practically the same district, the output from the mines last week amounted to 180 tons. This is a section which could be advantageously prospected. Other regions in the territory have become so well known to mining men that their attention has been diverted to a great extent away from the promising Hillsborough country, although it has been demonstrated there is plenty of gold and other mineral in that region only awaiting development.

In the Ortiz mine grant things are looking lively. The men who have control of the Edison interest there do not say much, but it is generally known that the machinery for the intended gigantic operations on that grant by the Edison Company is being gotten ready in the East as fast as possible, and that before very long a large number of men will be finding employment in producing the yellow stuff from that immense deposit of ore.

THE ORTIZ MINE.

The Ortiz mine is now being run to its full capacity, about 50 tons per day being the average. This mine bids fair to become a wealth producer, and it is significant that but a few months ago the boiler horsepower at that mine was but seven. Within a few months two changes, both for more power, have been instituted, and to-day they are using a 100-horsepower boiler to its full capacity, with the probability in the near future of being compelled to add more as their property reaches a higher state of development.

The Shoshone, in the same country, is another proposition which is very well thought of, and the owners are now engaged in sinking another shaft. At a depth of 20 feet, 4 feet of mineral has been disclosed, and predictions for the future of that property are very bright.

THE COCHITI DISTRICT.

In the Cochiti district and around Bland and Golden things are particularly promising. Bland seems to be a trifle more favored so far as new people and prospectors are concerned, it being reported that new arrivals to that camp have averaged 10 per day for some time back. As few of the new prospectors seem to have any thought of leaving, it must be taken as conclusive evidence that the camp is in a sound, healthy condition. Most of the new arrivals are those directly concerned in mining, and as there is a large unexplored and unclaimed body of land in that vicinity yet, the prospects seem to be alluring for the prospector. Newly opened claims are very easily disposed of, but the owners seem to be inclined to hold on, knowing that time will increase the value of their properties. The Cochiti is undoubtedly the best paying region in the Territory.

NOT A BOOM MOVEMENT.

The unusual developments, both under way and projected, are not the result of a boom. They are but the honest, gigantic stride forward of a surpassingly rich country, whose resources are beginning to be known. The latest big project is the substitution of electricity for steam as the motive power in that district. With a big dam constructed across the Rio Grande about 12 miles above the Albermarle group of mines, and an electric power house at that point large and powerful enough to furnish power to not only the mills but for the tramways and lighting purposes, it is plain to be seen that the Cochitis will be prosperous. This scheme is a bona fide proposition and will be carried out by the manager of the Albermarle, backed by his

company. One mining deal was consummated this week whereby a Mr. Weatherhead, of Cleveland, Ohio, gained control of the Gleason mine at Golden. He proposes to immediately install new reduction and smelting works on his claim and the property will no doubt pay out big. It has a 2½-foot vein ranging from \$20 to \$200 to the ton.

In the Crown Point active work is being done, drifts being run and the contractors report the ore improving at every foot of advance. The Monte Cristo has been enjoying a run of luck, and the owners have ordered 100 tons of machinery for their placer claims. On the Ermine extension development has been recently done, the results proving highly satisfactory, the property showing a 4-foot vein running through. On the Albemarle group everything is humming. The pay roll of this mine already averages \$16,000 per month, and that property bids fair to make a national reputation as a producer of gold. While gold commands the most attention, the silver propositions are all right, and should silver ever be restored to its rightful place, prodigious production of that metal in Central New Mexico would be chronicled. Opals are frequently found in this part also. In Santa Fe and more particularly Taos County, deposits of copper are being exploited with good results, and the Copper Glance mine in Taos County has been bonded to Chicago capitalists.

THE RED RIVER COUNTRY.

Up in the Elizabethtown and Red River country everything betokens a very busy summer, and like the other mining districts of the Territory seems to be very sanguine of pronounced and abundant success.

Every able-bodied man in that region is able to instantly command work. At the Mallette property very fine free gold specimens have been shown up, with the full expectation that the good prospects will continue. The "I Own" is undergoing considerable development. H. B. Tompkins' property on the Black Mountain, in the same vicinity, is pauning out well, his shaft at 35 feet showing up a 4-foot vein of excellent ore. One of the promising claims is that of Henry Young, who has been actively at work taking out ore that assayed \$500 per ton. The Anderson property at Elizabethtown is authoritatively reported as sending \$100 ore to the mills. In the northern region, and, in fact, in the several mining districts of the Territory, the mining outlook for the coming season is particularly enticing, and there is no doubt but the present success will prove a great benefit as a sound advertising medium for the undoubtedly great and rich mining resources within our borders.

THE MINES OF NEW MEXICO.

[From Territorial Bureau of Immigration.]

GOLD, SILVER, COPPER, LEAD, IRON, COAL, AND ALL THE PRECIOUS AND USEFUL METALS AND MINERALS—FIELDS FOR THE PROSPECTOR AND INVESTOR IN EVERY COUNTY OF THE TERRITORY—A CLIMATE THAT AFFORDS AN OPPORTUNITY FOR THE MINER TO WORK THE YEAR 'ROUND—THE ATTENTION OF MINING MEN FROM THE NORTHERN STATES NOW BEING ATTRACTED TO THIS TERRITORY, RICH IN MINERAL, AND LARGE-SIZED INVESTMENTS ARE BEING MADE.

A vast mineral field.—Mr. J. D. Bone, a mining expert of good standing, who has a practical knowledge of the different mineral districts in the Territory, says:

"As a broad assertion, we may say the whole mountain region in New Mexico is a fair and a reasonably sure prospecting field. It is a very false idea to suppose that a few favored spots, at which development has taken place—merely little pin points on the vast area of known mineralized territory—are all, or one-thousandth part, of the great resources of our mountains.

"We do not hesitate to say that quite a promising field for prospecting would be right in the midst of any one of our oldest camps. This being true in the oldest and liveliest mining camps of the Territory, surely the vast field of known mineral-bearing area has been but indifferently prospected, if indeed, at all.

"The seeker after hidden wealth has here in New Mexico a wide field, one which it is not at all improbable will exceed in value anything yet discovered. The areas most likely to produce results are where eruptive forces have been most active, and the disturbances and crystallizing of the strata most pronounced.

"In this territory, with its 122,444 square miles, are rich and inviting fields, practically untouched by the pick of the prospector, and offering the miner and capitalist opportunities for rich returns for labor and money expended, such as are very seldom found in any mining section of the great west. As good, if not better, chances are presented within the boundaries of this territory than were found in Leadville or Cripple Creek, Colo.

Mining districts.—This Territory has now some eighty-five mining districts, which are scattered widely, and cover a large section of country, thus showing that the mineral wealth is by no means confined in any one special place, but largely distributed over a great extent of territory.

"The territory in New Mexico already more or less developed equals 30,000 square miles of mineral-bearing country, and the better developed districts of this vast extent are as rich as any exploited elsewhere in the United States, and its as yet great 'undeveloped areas' offer to the intelligent prospector and energetic man of means opportunities found in no other mining country.

"The great mineral belt.—By examining any ordinary map of the Western States it will be seen that all of the most valuable recent developments of mineral in southern Colorado are on a well-defined line following the Rocky Mountain system into and across New Mexico, and that that line extends through the central west and southwest portions of the territory without a break of any considerable extent.

"That conditions along this extent of country, almost 400 miles in length, in many respects resemble the gold and silver bearing formations of Creede, Cripple Creek, Rosita, Silver Cliff, and the great San Juan country of Colorado can not be doubted, and in the coming years it is not unlikely this section of New Mexico may develop many places as productive of wealth as the above-named Colorado districts.

"New Mexico gold fields.—Lying just south of the great commonwealth of Colorado, our first counties are San Juan, Rio Arriba, Taos, Colfax, and Union.

"The evidences of gold throughout San Juan are such that this county becomes attractive as a point where extensive hydraulic operations may be conducted with every assurance of success.

"Passing east from this county we come to Rio Arriba, where the mineral deposits, worked to any great extent, generally take the form of placers and vast fields of coal. It would seem to us that in the vicinity of Tierra Amarilla and Good Hope would be a good and most promising prospecting field for the precious metals.

"Rich placers.—Near Abiquin, along the Chama River, are gold placers that cover nearly 20,000 acres, which show a remarkable average yield of gold, and as water seems to be plentiful for most of the year, this vicinity is unexcelled as a point where large and paying mining enterprises may be conducted. Examination of these deposits along the Chama River are now being made by Prof. F. A. Reynolds, acting under directions from an Eastern mining syndicate, and the daily press report this gentleman as saying that gravel tested by him runs from 50 cents to \$3 in gold per cubic yard.

"The deep placer deposits of Taos County, along the Rio Grande, are probably the most extensive in the United States, and investigation warrants us in saying that nothing since the discovery of California and Australia is comparable for its measurable resources of gold available by the hydraulic process. Reference to the report of Prof. Benjamin Silliman, of Yale College, to the Commissioner of the General Land Office, published in 1880, will fully convince even those who are sending men and money to explore Alaska's frozen fields that right here in New Mexico—a land of perpetual sunshine—are equally rich and much more desirable gold placer deposits. The altitude of these deep placer deposits is perhaps 7,000 feet; still, because of this locality being sheltered by the encircling mountains, and because of its more southern latitude, placer mining can be carried on quite nine months of each year and at points the entire year. These great placer deposits do not alone constitute Taos County's great undeveloped resources, for her mountains are rich in metals, as is fully shown at numerous points where there are producing gold, silver, and copper mines.

"Quartz mining.—The Red River country in Taos County is fast becoming known to mining men throughout the world as a district destined in a very short time to rival any one of our greatest gold producing sections.

"At La Belle, Amizette, and other points development is being rapidly pushed, and it may be said that Taos County has fairly entered upon a bright mining future.

"To the east of this rich county of Taos lies Colfax County, a district which has produced many millions in gold, and which to-day gives brighter promise than at any time in its history. A very large proportion of the rich mineral lands of this county are comprised within the boundaries of the Maxwell Land Grant Company's property. The liberal policy pursued by this company in its dealings with the prospector is worthy of notice. The management of this grant has laid down rules very similar to those governing mineral locations on public domains, and the property is thrown open to the prospector and miner, who can at a nominal cost acquire title and develop mining properties on the grant. The old Baldy district on this grant is a large gold producer, so also is the Ute Creek district, where is located the famous old Aztec mine, with a record of almost a million in gold. The Montezuma mine, on what is commonly known as Montezuma Hill, has produced between \$200,000 and \$300,000.

There is greater activity in the west Moreno Valley district than ever before, and only 3 miles from the new but promising camp of Hematite are the world-famed Elizabethtown placers, which have produced over \$200,000 in gold. Aside from these famous placers it is said that miners, in a crude way, produce large sums in gold from placer ground but little known.

Grand opening for prospectors.—Little mining of the precious metals has been done

in Union County, but it is not an unlikely field for prospecting for our undeveloped mineral resources.

"Passing from Union County, we next take up Mora and San Miguel counties, two sections of the Territory which seem to have been but indifferently prospected. The mountain range west of the city of Las Vegas lies directly in the gold producing belt, and surface indications are most favorable.

"South from the city of Santa Fe, Santa Fe County, and not far from the town of Cerrillos, in a disconnected range of mountains, with perhaps an average width of 7 miles, is one of the most remarkable mineral regions of New Mexico, and we may say of the world. This range travels north and south and is known as the Ortiz Mountains. The surface indications are unsurpassed, and a number of fine bodies of low-grade, free-milling gold ores are found, among which may be especially mentioned the famous Cunningham Hill and adjoining properties near Dolores. The main western lode, especially in its southern extension, is rich in copper, as found in the workings of the San Pedro Copper Company. This region was known to the early Spanish explorers, who, upon their advent into this country, discovered and worked the rich gravel deposits at the base of Ortiz Mountain, in and about San Pedro, Golden, and Dolores.

"*A million a year.*—An experienced and reliable expert who examined these extensive placers a few years ago reported that, 'if sufficient water were placed thereon, these placers could be made to yield \$1,000,000 in gold per year for over twenty-three years.' The 'country rock,' being soft and porous so that the vein matter lying near the surface rapidly oxidizes and the oxidized 'honeycomb' quartz remaining with its vast supply of free gold, is eroded by degrees and being carried down the slope to feed the placers below.

"*The famous turquoise mine.*—In the vicinity of Cerrillos is a small section of mountainous country, in which is located one of the world's best known and most productive turquoise mines. There are, as near as we can learn, some sixty or seventy turquoise claims in New Mexico, some ten or a dozen in active and profitable operation.

"The output of turquoise in New Mexico, as taken from official sources, was \$150,000 in 1891, \$175,000 in 1892, \$200,000 in 1893, \$250,000 in 1894, \$350,000 in 1895, and \$475,000 in 1896, but it is openly asserted that the true value of turquoise mined since 1890 has been greatly underestimated. As an illustration, one of these mines sold in 1893 for \$250,000, and, according to the statements of a former owner, has paid a million and a half a year since that time. One single stone taken out is reported to have been bought for \$6,000 in New York.

"*Cochiti and Hell Canyon.*—Leaving Santa Fe County, we next take up Bernalillo, which has an area of 8,000 square miles, of which 5,000 square miles are classed as mineral lands. The well-known Cochiti mining district practically dates from discoveries made in 1893. Progress was retarded by title suits under old grants, but a decision favorable to the miners was recently handed down by the United States Supreme Court, and now development in this wonderful camp goes steadily forward.

"East of the city of Albuquerque some 20 miles is the Hell Canyon district, destined in the near future to attract widespread attention. The large bodies of free-milling ores disclosed in the workings of the mines are probably as extensive for amount and character and work as any in the United States. These large bodies of ores are deserving of investigation, and if operated on proper lines will produce handsome returns for many years to come. Considerable mining machinery is now being placed in the camps and active operations will soon commence.

"In our travels south we have now come to Socorro, a county blessed with abundant natural resources, extending as it does about 170 miles east and west by 100 miles north and south, and containing over 10,000,000 acres, some sections of which have produced millions in mineral wealth. This county, which for many years past has been steadily adding to the mineral wealth of the world, stands to-day upon the threshold of a brighter future than at any time in its history.

"*A carload of bullion a day.*—Just west of Socorro City there are large deposits of lead-silver ores, but only at one point in the county is this class of ores now being mined to any great extent—in the Magdalena Mountains. Water Canyon and Copper Creek districts, west of Socorro City, are very rapidly coming into prominence as gold producers, and with the improvements now being made bid fair to rival the best-known sections of the Territory. At the town of Kelley, some 30 miles west of the city of Socorro, are located the famous Kelley mines, heavy producers of lead-silver ores. Under the able management of Capt. A. B. Fitch the Graphic mines are producing with ease sufficient ore to keep in full operation day and night the 100 ton smelter. A carload of bullion is turned out by this plant every twenty-four hours, thus making lively times not only for the many miners in and about Kelley, but every man in this section reaps a measure of benefit from this industry.

"Away to the west in Socorro County, near where the Territorial boundary line joins Arizona, is located the Cooney district, a section at one time producing high-grade silver ores, but whose mines are now being worked largely for the gold values contained in the ores.

"The far-famed Black range.—We have now reached the county of Sierra, wherein are located the well-known Mimbres, or Black range of mountains, which in many respects are among the most remarkable in the United States. It has been most truly said that an extent of country from San Augustine plains on the north to Cooks Peak on the south, a distance of over 120 miles, is mineralized in a greater or less degree throughout. Mines located along this mineralized belt of country have long been famed as steady producers of high-class ores of all the useful metals, including gold, silver, copper, lead, and iron. The Black range extends in a northerly and southerly direction, and is about 40 miles in width. The apex or summit of the range forms what is known as the Continental Divide. The topography of the country is such as to make any point easily accessible."

A yet undeveloped field.—A large percentage of the known mineral-bearing area of New Mexico has been but indifferently prospected—very much of it not at all. Consequently there is still here a wide field for the seeker after hidden wealth. It is therefore not impossible, or even improbable, that there are yet here quite as profitable fields, untouched by the pick of the prospector, as any that have been developed. There is good reason to believe that the southerly western portions, nearly all mountainous, bordering Arizona and Old Mexico, abound in all the valuable minerals equally if not beyond the northeasterly portions of the mountain areas, nor that in due time, under the rigorous search of the energetic and intelligent prospector, great values will in the not distant future be developed, and to an extent and value equal, if not beyond, any that have yet been reached.

The capitalist, miner, or prospector who decides to cast his lot here will find the foundations of a broad and enlightened society well established. They will find a generous, progressive, and liberal-minded people, ready to lend a helping hand to every comer. They will find order, society, law, and an enlightened public sentiment ruling the Territory.

Favorable climatic conditions.—Not only the character of these deposits as given by conservative and reliable correspondents, but the accessibility and value as shown by the daily record of output and the vast extent of the field covered, mark this as the most attractive field covered to the miner and mine hunter yet developed on the American continent, if not in the world.

The annual report of the New Mexico section of the United States Weather Bureau for 1897, published in Bulletin No. 1, 1898, contains valuable information in regard to the climatic conditions in New Mexico, especially to prospectors and miners. While it shows, as compared to more northerly latitudes, that the mean temperature of the mining sections of New Mexico was seldom below the freezing point and the weather was very rarely too cold for prospecting or surface-mining work. If so disposed, the miner can put in the entire year prospecting or mining, at his pleasure or convenience.

Mining claims, how located.—The bureau frequently receives inquiries asking for information concerning the manner of locating mineral claims in New Mexico, and if our laws differ from the regulations prescribed by the United States General Land Office.

We can say that, in the main, the United States laws, as found in the Revised Statutes, governing the location of claims, govern also in New Mexico; the laws of New Mexico making one additional requirement relating to the locating of mines, which is set out in section 1 of chapter 25, Laws of 1889, as follows:

"That the locator or locators of any mining claim, located after this act shall take effect, shall, within ninety days from the date of taking possession of the same, sink a discovery shaft upon such claim to a depth of at least 10 feet from the lowest part of the rim of such shaft at the surface exposing mineral in place, or shall drive a tunnel, adit, or open cut upon such claim to at least 10 feet below the surface exposing mineral in place."

The United States laws prescribe that mining claims upon veins or lodes of quartz or other rock in place, bearing gold, silver, cinnabar, lead, tin, copper, or other valuable deposits, shall not exceed 1,500 feet in length along the vein or lode; and the claim is limited to 300 feet on each side of the vein or lode. (See sec. 2320, Rev. Stats.)

Tunnels.—Where a tunnel is run for the development of a vein or lode, or for the discovery of mines, the owners of such tunnel shall have the right of possession of all veins or lodes within 3,000 feet from the face of such tunnel on the line thereof to the same extent as discovered from the surface; and locations on the line of such tunnel, of veins or lodes not appearing on the surface, made by other parties after the commencement of the tunnel, and while the same is being prosecuted with reasonable diligence, shall be invalid. Failure to prosecute the work on the tunnel for six months shall be considered an abandonment. (See sec. 2323, Rev. Stats.)

Remarkable activity.—The eyes of mining men being now upon the remarkable activity which has suddenly opened up in the Cochiti district, we quote what Mr. Frank W. Wynkoop says of one of our live camps:

"A movement of great importance to the mining world, and especially to New Mexico, is at present in progress in the Cochiti mining district, which is situated in

Bernalillo County, some 50 miles north of Albuquerque, the county seat, and some 40 miles west of Santa Fe, the capital of New Mexico. Mining is reviving throughout the district. Mining companies of long and general experience, supported by unlimited capital, have taken hold of many of the larger properties, and have instituted operations of a nature not to be surpassed by those of any mining district in the West. The leading features of these operations consist of the construction of a steel mill of 125 tons daily capacity, at a cost of \$250,000, to treat the ores of the Albemarle group of four mines; the resumption of operations at the Bland mill, under improved methods and with excellent success in the saving of the gold and silver values contained in the ores of the Lone Star group of mines, at a cost sufficiently low to afford a handsome profit; the projected new 200-ton mill to treat Crown Point and Pino Canyon custom ores, and the development of many of the mining properties which, up to a few months ago, lay idle for the need of capital to make them paying mines.

"To give an idea of the magnitude operations in this district are attaining we will mention the fact that within the past three months extensive developments have been in progress upon four large properties; five other large groups of claims have been taken under lease and bond by responsible mining companies of long experience for large amounts; the construction of one quartz mill has been completed and the construction of another mill is in progress, while two others are in contemplation of early erection.

"The entire Cochiti mining district embraces a mineral region some 6 miles from east to west by about 18 miles from north to south, and includes three distinct parallel quartz lodes, extending north and south and cropping above the surface, which are of enormous size and possess an even value of \$8 to \$40 to the ton, selected ore running as high as \$1,800 to the ton.

"The indications of the present leave little doubt that the Cochiti mining district will henceforth enjoy an era of great prosperity."

A Klondike at home.—The "Klondike of the Southwest" is the name frequently applied to New Mexico, and judging from the flattering progress she has made in mining since January 1, 1898, before the end of the year the fever for the gold in the "Klondike of the Southwest" will be as high and unabating as it now is for the "Klondike of the Northwest," and, in contrast and comparison, producing gold against gold, railroad facilities against reindeers and dogs, food against famine, comfort and health against hardships, and happiness against misery.

Our vast natural resources.—It is no exaggeration to affirm that in point of natural resources none of the Rocky Mountain States exceed New Mexico. In addition to gold, silver, copper, lead, and zinc, coal (anthracite and bituminous), fire clay, alum, sulphur, salt, gypsum, onyx, and marble are found in large deposits. New Mexico supplies the world with turquois.

SILVER CITY, N. MEX., August 29, 1898.

SIR: In compliance with section 3 of an act of Congress approved March 3, 1891, entitled "An act for the protection of the lives of miners in the Territories," I beg leave to submit herewith the sixth annual report of this office, covering the fiscal year ended June 30, 1898.

JOHN W. FLEMING,

United States Mine Inspector for the Territory of New Mexico.

Hon. MIGUEL A. OTERO, Governor, Santa Fe, N. Mex.

OTERO MINE.

[Alex. Bowie, superintendent; John Steward, pit boss.]

Located about 2½ miles in an easterly direction from the town of Gallup, Bernalillo County, N. Mex. Owned and operated by the Caledonian Coal Company. Kind of coal, lignite; thickness of vein, 4 feet 6 inches; total output, fiscal year, 90,366 tons; estimated value of output, \$136,049; depth of slope, 1,300 feet; value of improvements this year, \$19,776.42; average number of men employed outside, 25; average number of men employed inside, 150; average number of boys employed, 2; where coal is marketed, Santa Fe Pacific Railroad and California; number of days mine worked, 248.

This mine is situated on a spur about 1 mile in length connecting with the Santa Fe Pacific Railroad near Gallup Station, is operated by a slope 1,300 feet in length, and has a capacity of about 500 tons per day. The product is sold to the Santa Fe Pacific Railroad Company and to towns in California. This mine is ventilated by an air shaft and furnace.

THERE ARE SEVERAL SMALL VEINS SHOWING IN CROP LINES ABOVE
THOSE GIVEN IN THIS SECTION, BUT THEY HAVE NEVER BEEN FULLY
PROSPECTED.—

A COPY.

SECTION OF STRATA OF THE
GALLUP COAL CO.'S NO. 8.

SCALE

NOTE.—

THE BLACK DIAMOND MINE IS WORKING A
VEIN 4 TO 6 FEET THICK, WHICH IS UNDER THOSE
GIVEN ABOVE. ALSO A 5 FOOT VEIN LOCATED BY
DRILL HOLE IN THE BOTTOM OF THE CROWN POINT
SHAFT WHICH IS STILL BELOW THE DIAMOND VEIN.

RECORD OF INSPECTION.

September 18, 1897.—On this date I inspected the mine known as the Otero mine. I measured 4,500 cubic feet of air entering the mine per minute and measured 5,000 cubic feet of air returning through the return air course. I found the ventilation good throughout the workings of the mine and found the mine in very good condition.

November 11, 1897.—I again inspected the Otero mine. I measured 10,290 cubic feet of air entering the mine per minute and measured 10,550 cubic feet of air returning through the return air course. I found the ventilation good throughout the workings of the mine and found the mine in good condition.

January 11, 1898.—I again inspected the Otero mine. I measured 12,080 cubic feet of air entering the mine per minute and measured 12,405 cubic feet of air returning through the return air course. I found the workings of the mine well ventilated, and found the mine in fair working condition.

March 11, 1898.—I again inspected the Otero mine. I measured 8,050 cubic feet of air entering the mine per minute and measured 8,400 cubic feet of air returning through the return air course. On this tour of inspection I found the miners working too far ahead of the air in Nos. 1 and 2 right butt entries, and ordered crosscuts driven at the face of the entries, so as to force the air to the face of the workings.

GALLUP MINE.

[Hugh McGinn, superintendent; James McQuade, pit boss.]

This mine is located about 3 miles northwest of the town of Gallup, Bernalillo County, N. Mex. Owned and operated by the Crescent Coal Company. Kind of coal, lignite; thickness of vein, 6 feet; total output, fiscal year, 141,145 tons; estimated value of output, \$220,000; depth of slope, 3,000 feet; value of improvements this year, not given; average number of men employed outside, 24; average number of men employed inside, 240; average number of boys employed, 5; where coal is marketed, New Mexico, Arizona, and California; number of days mine worked, 235.

RECORD OF INSPECTION.

September 21, 1897.—On this date I inspected the Gallup mine. The fan was running 90 revolutions per minute, and I measured 24,000 cubic feet of air entering the mine per minute and measured 24,075 cubic feet of air returning through the return air course. I took air measurements throughout the workings of the mine and found the air distributed in compliance with the law. On this visit the new air shaft had been sunk to a depth of 120 feet, which is to connect with No. 15 left entry, and when the connection with the shaft and entry is made the ventilation will be very much improved.

November 15, 1897.—I again inspected the Gallup mine. The fan was running 90 revolutions per minute, and I measured 30,000 cubic feet of air entering the mine per minute and measured 30,300 cubic feet of air returning through the return air course. I found the air distributed throughout the workings of the mine in compliance with the law. Found the workings well timbered and in good condition.

January 15, 1898.—On this date I inspected the machinery of the Gallup mine. I found the fan required some repairs and ordered the superintendent to have the necessary repairs made on the fan as soon as possible. I also inspected the new air shaft and found it to be 232 feet deep, but the connection had not been made with No. 15 left entry, and I ordered the superintendent to push the work as fast as possible.

SUNSHINE MINE.

[Hugh McGinn, superintendent.]

Located about 1½ miles north of the town of Gallup, Bernalillo County, N. Mex. Owned and operated by the Crescent Coal Company. Kind of coal, lignite; thickness of vein, 5 feet; total output, fiscal year, 48,450 tons; estimated value of output, \$80,000; depth of slope, 2,000 feet; value of improvements this year, none given; average number of men employed outside, 12; average number of men employed inside, 110; average number of boys employed, 3; where coal is marketed, New Mexico, Arizona, and California; number of days mine worked, 231.

This mine is located on a spur 1½ miles in length connected with the Santa Fe Pacific Railroad; operated by a slope; capacity, about 500 tons per day; ventilated by a 12-foot Crawford & McCrimmon fan.

RECORD OF INSPECTION.

September 16, 1897.—On this date I inspected the Sunshine mine. The fan was running 65 revolutions per minute, and I measured 27,840 cubic feet of air entering the mine per minute, and measured 25,200 cubic feet of air per minute returning through the return air course, thus making a difference of 2,640 cubic feet of air between the intake and outcast. This is caused by some of the air escaping into the old workings of the Black Diamond mine, which is abandoned. I found the ventilation good throughout the workings of the mine. Found places in the roof of the slope which required timbering and ordered said places timbered. The pit boss informed me that new timbers would be put in that night. Otherwise I found the mine in good condition.

November 13, 1897.—On this date I inspected the Sunshine mine. The fan was running 90 revolutions per minute, and I measured 26,460 cubic feet of air entering the mine per minute, and measured 26,250 cubic feet of air returning through the return air course. I found the mine well ventilated and found the workings of the mine in good condition.

January 12, 1898.—I again inspected the Sunshine mine. I measured 28,600 cubic feet of air entering the mine per minute, and measured 28,800 cubic feet of air returning through the return air course. I found the mine well ventilated. Found No. 3 entry in bad condition, and ordered the pit boss to have the entry timbered at once. The pit boss ordered the timbers brought into the mine, and instructed the timbermen to timber the entry that night.

March 9, 1898.—On this date I again inspected the Sunshine mine. The fan was running 75 revolutions per minute, and I measured 40,000 cubic feet of air entering the mine per minute, and measured 41,000 cubic feet of air returning through the return air course. I found the ventilation good throughout the workings of the mine, and found the mine in very good condition.

CROWN POINT MINE.

[Hugh McGinn, superintendent; Archie Black, pit boss.]

This mine is located about 3 miles in a northerly direction from the town of Gallup, Bernalillo County, N. Mex. Owned and operated by the Crescent Coal Company. Kind of coal, lignite; thickness of vein, 3 feet 6 inches; total output, fiscal year, 61,194 tons; estimated value of output, \$92,000; depth of shaft, 225 feet; value of improvements this year, not given; average number of men employed outside, 12; average number of men employed inside, 140; average number of boys employed, 4; where coal is marketed, New Mexico, Arizona, and California; number of days mine worked, 231.

This mine is located on a spur 3 miles in length connecting with the Santa Fe Pacific Railroad near Gallup Station; is operated by a shaft 225 feet deep; capacity, about 250 tons per day; ventilated by a 12-foot Crawford & McCrimmon fan and an air shaft.

RECORD OF INSPECTION.

September 17, 1897.—On this date I inspected the Crown Point mine. The fan was running 60 revolutions per minute, and I measured 16,660 cubic feet of air entering the mine per minute, and measured 16,800 cubic feet of air returning through the return air course. I found the ventilation good throughout the workings of the mine. I found the mine in good condition.

November 12, 1897.—I again inspected the Crown Point mine. The fan was running 85 revolutions per minute, and I measured 17,920 cubic feet of air entering the mine per minute, and measured 18,000 cubic feet of air returning through the return air course. I found the roof of No. 1 straight entry in bad condition, and ordered the pit boss to have the loose rock taken down and the entry timbered with good, substantial timber.

January 13, 1898.—I again inspected the Crown Point mine. The fan was running 70 revolutions per minute, and I measured 19,950 cubic feet of air entering the mine per minute, and measured 21,840 cubic feet of air returning through the return air course. I found the air distributed in compliance with the law. Found several places along No. 1 straight entry which required timbering and ordered the pit boss to have said places timbered as soon as possible, and the pit boss informed me that the work would be commenced at once. The timbermen were ordered to proceed with the work.

March 12, 1898.—I again inspected the Crown Point mine. The fan was running 85 revolutions per minute, and I measured 19,950 cubic feet of air entering the mine per minute, and measured 20,540 cubic feet of air returning through the return air

course. I found the mine well ventilated and found the working places well timbered. I found that the escape shaft did not have stations or landing places in the shaft, and I ordered the general manager, W. Weaver, to have stations erected in the shaft, at a distance of 30 feet apart, from the top to the bottom, and have the stations put in as soon as possible. The general manager informed me that he would comply with my request.

CATALPA MINE.

[Hugh McGinn, superintendent.]

Located about 3 miles in a southeasterly direction from the town of Gallup, Bernalillo County, N. Mex. Owned and operated by the Crescent Coal Company. Kind of coal, lignite; thickness of vein, 6 feet; total output for fiscal year, 4,356 tons; estimated value of output, \$8,000; depth of slope, 1,000 feet; value of improvements this year, not given; average number of men employed outside, 8; average number of men employed inside, 60; where coal is marketed, New Mexico, Arizona, and California; number of days mine worked, 46.

This mine is situated on a spur 3 miles in length connecting with the Santa Fe Pacific main line near Gallup Station. Capacity is about 300 tons per day, and is ventilated by an air shaft. This has not been worked to any extent. All that has been done was in the way of development and of getting the property in readiness for use at any time when there was demand for the product.

RECORD OF INSPECTION.

September 14, 1897.—On this date I inspected the Catalpa mine. At the time of my inspection there were only two miners employed in the mine.

November 18, 1897.—I again inspected the Catalpa mine and found only two miners employed in the mine. Workings in good condition.

ROCKY CLIFF MINE.

[Stephen Canavan, general manager; William Steward, pit boss.]

This mine is located about 2 miles in an easterly direction from the town of Gallup, Bernalillo County, N. Mex. Owned and operated by Stephen Canavan. Kind of coal, lignite; thickness of vein, 4 feet 6 inches; output for fiscal year, 22,000 tons; estimated value of output, \$33,000; depth of slope, 900 feet; value of improvements this year, \$4,300; average number of men employed outside, 3; average number of men employed inside, 32; where coal is marketed, Arizona and California; number of days mine worked, 250.

This mine is located on a spur about 2 miles in length connecting with the Santa Fe Pacific Railroad near Gallup Station. It is ventilated by a furnace. Capacity, 150 tons.

RECORD OF INSPECTION.

September 15, 1897.—On this date I inspected the Rocky Cliff mine. Measured 6,300 cubic feet of air entering the mine per minute, and measured 6,475 cubic feet of air per minute returning through the return air course. I found the mine to be well ventilated and found the workings in good condition.

November 16, 1897.—I again inspected the Rocky Cliff mine. I measured 2,730 cubic feet of air entering the mine per minute, and measured 3,040 cubic feet of air returning through the return air course. I found men working too far ahead of the air on the first left entry, also on first right entry, and ordered the pit boss to have cross cuts driven at the face of the entries. I also found the straight entry, or hauling road, in bad condition and ordered it timbered. The pit boss informed me the work of timbering the entry would be commenced at once.

January 10, 1898.—I again inspected the Rocky Cliff mine. I measured 6,500 cubic feet of air entering the mine per minute, and measured 6,550 cubic feet of air returning through the return air course. I found the ventilation good throughout the workings of the mine and found the mine in good condition.

March 9, 1898.—I again inspected the Rocky Cliff mine, and measured 5,510 cubic feet of air entering the mine per minute, and measured 6,450 cubic feet of air returning through the return air course. I found the ventilation good throughout the workings of the mine, but found the main hauling roads to be very dusty, and ordered Mr. Canavan, the general manager, to have the roads cleaned and haul the dust out of the mine. Before I took my departure from Gallup the work of cleaning the dust out of the mine was performed.

W. A. CLARK COAL MINE.

[W. L. Bretherton, agent.]

This mine is located about 5 miles west of the town of Gallup, Bernalillo County, N. Mex. Owned and operated by W. A. Clark. This is a new mine, development having been commenced December 30, 1897. Kind of coal, lignite; thickness of vein, 7 feet; total output since December 30, 1897, to June 30, 1898, 3,500 tons; estimated value of output, \$4,000; length of drift, 600 feet; value of improvements, not given; average number of men employed outside, 30; average number of men employed inside, 50; where coal is marketed, Jerome, Ariz.; number of days mine worked, producing coal, 30.

RECORD OF INSPECTION.

January 17, 1898.—On this date I inspected the W. A. Clark mine. At the time of my visit to the mine, 4 miners were employed therein. On this date the development work on this mine consisted of one entry driven 140 feet on a vein of coal; one entry 75 feet, and a shaft sunk to a depth of 40 feet. The vein of coal is 7 feet thick, and is a good quality of lignite coal. The mine has every indication of being a large producer in the near future.

MULHOLLAND & CASNA MINE.

[Gus Mulholland, general manager.]

This mine is located 2½ miles west of the town of Gallup, Bernalillo County, N. Mex., and is being operated by Gus Mulholland and Andrea Casna. The coal is hauled in wagons to Gallup Station and shipped to southern California. This is a new mine, development work having been commenced in the month of July, 1897. Kind of coal mined, lignite; thickness of vein, 4 feet; total output, fiscal year, 200 tons; estimated value of output, \$400; depth of slope, 500 feet; total value of improvements, \$4,000; average number of men employed, outside, 2; average number of men employed, inside, 4; where coal is marketed, southern California; number of days mine worked, 90.

RECORD OF INSPECTION.

September 22, 1897.—On this date I visited the Mulholland & Casna mine. This mine has a shaft 70 feet deep, at the bottom of which a vein of coal 4 feet in thickness was developed. Also a slope has been driven a distance of 230 feet for the purpose of making connection with the shaft, which will be used as an air shaft. At the time of my visit the connection had not been made. Seven men were employed at the mine.

November 17, 1897.—I again inspected the Mulholland & Casna mine. I found the slope which was being driven to connect with the shaft had been completed and the vein of coal had been encountered, showing the vein of coal to be 4 feet in thickness. Eight miners were employed in the mine. Found the workings of the mine in very good condition.

January 14, 1898.—I again inspected the Mulholland & Casna mine. I measured 4,600 cubic feet of air entering the mine per minute, and found the ventilation good throughout the workings of the mine. Since my previous visit to this mine three rooms had been turned off from the main entry. I found the roof of No. 2 room in a dangerous condition, and ordered Mr. Mulholland to have props put in at once, so as to make the roof of the room secure from all danger. The props were brought into the mine and the work commenced at once. On this visit only four men were employed in the mine. This mine is not being operated at present.

BEACON HILL MINE.

[Theodore A. Fabro, general manager.]

This mine is located about 1½ miles south of the town of Gallup, Bernalillo County, N. Mex. The coal is hauled in wagons and sold for domestic use in Gallup, N. Mex. Kind of coal, lignite; thickness of vein, 6 feet; total output, fiscal year, 600 tons; estimated value of output, \$1,080; depth of slope, 900 feet; value of improvements this year, \$420; average number of men employed outside, 1; average number of men employed inside, 2; number of days mine worked, 110.

RECORD OF INSPECTION.

September 23, 1897.—On this date I inspected the Beacon Hill mine. I inspected the workings and found them in good condition. The mine was not being operated on this date.

January 19, 1898.—I again inspected the Beacon Hill mine. At the time of my visit to the mine only four miners were employed therein, and I found the workings of the mine in good condition. On account of the few men employed in this mine I did not deem it necessary to make further inspections of the same.

CANAVAN & BAILEY MINE.

[Thomas Cross, general manager.]

Located about three-fourths of a mile in a northwesterly direction from the town of Gallup, Bernalillo County, N. Mex. Owned and operated by the Summit Coal Company. Kind of coal, lignite; thickness of vein, 5 feet; total output, fiscal year, 900 tons; estimated value of output, \$1,200; average number of employes inside, 6; average number of employes outside, 2; length of slope, 650 feet; number of days mine worked, 65.

The product of this mine is hauled to Gallup Station, N. Mex., and shipped to California. Some of the coal is also sold to the local market at Gallup, N. Mex.

RECORD OF INSPECTION.

September 20, 1897.—On this date I inspected the Canavan & Bailey mine. I found the main air course in bad condition, having been partially filled with falls of rock from the roof of the air course. I ordered the general manager to have the air course cleared of the falls of rock. I was informed by the general manager that the work of clearing the air course would be commenced at once.

November 10, 1897.—I again inspected the Canavan & Bailey mine. On this visit to the mine I found the mine in fair working condition. There were only three miners employed in the mine.

January 7, 1898.—I again inspected the Canavan & Bailey mine. On this date the mine was not being operated, but I found the workings of the mine in good condition. I also inspected the machinery and found the hoisting machinery, boilers, and ropes in good condition.

BLOSSBURG MINE.

[J. A. Wiggs, superintendent; James Walsh, pit boss.]

Located near Gardiner, about $4\frac{1}{2}$ miles in a westerly direction from the town of Raton, Colfax County, N. Mex. This mine is owned and operated by the Raton Coal and Coke Company. Kind of coal, bituminous; thickness of vein varies from 6 to 8 feet; total output, fiscal year, 210,000 tons; estimated value of output, this year, \$357,500; average number of men employed in and out side, 350; average number of boys employed, 10; length of drift, 9,000 feet; mine in operation, 240 days.

This mine is located on a branch of the Atchison, Topeka and Santa Fe Railroad, connecting with the main line at Dillon Station. This is the largest mine in the Territory, having a capacity of 1,500 tons per day. It is operated upon the double-entry system. The product is sold to the Atchison, Topeka and Santa Fe and the Mexican Central railroads.

RECORD OF INSPECTION.

October 7, 1897.—On this date I inspected the hoisting machinery of the Blossburg mine; also the boilers, ropes, cars, chains, etc., and found the machinery in good condition.

October 8, 1897.—I inspected the underground workings on the left side of the main entry in the Blossburg mine, and found the workings to be in good condition.

October 9, 1897.—I again inspected the Blossburg mine. I measured 8,400 cubic feet of air entering the mine per minute, and found the air distributed throughout the workings as follows, viz:

Cubic feet air.

Face of main entry	1,680
Last crosscut between seventh and eighth right entries	8,000
Last crosscut between ninth and tenth right entries	8,000

I found a large fall of rock on No. 10, right entry, and ordered the pit boss to have the entry cleared of the fall of rock. The mine was not being operated on this date.

December 8, 1897.—I visited the Blossburg mine for the purpose of inspecting room No. 20, which is located on the right cross entry, in which room a fatal accident had occurred, causing the death of William Sartoris. (See report of fatal accidents.)

December 9, 1897.—I inspected the underground workings of the Blossburg mine. I measured 18,840 cubic feet of air entering the mine per minute, and measured 19,040 cubic feet of air per minute returning through the return air course. I found the mine to be well ventilated, but found some of the timbers broken in Nos. 9 and

10, right entries, and ordered them replaced with new ones; otherwise I found the mine in good condition.

February 9, 1898.—I again inspected the Blossburg mine. I found the roof of main entry in a dangerous condition, and ordered the entry timbered in all places where the roof was not safe. The pit boss ordered the timbering of the entry commenced at once.

February 10, 1898.—I again inspected the Blossburg mine. I measured 8,160 cubic feet of air entering the mine per minute, and measured 6,545 cubic feet of air traveling in No. 18 left entry. I found the roof of Nos. 12, 13, and 14 rooms on No. 18 left entry in a dangerous condition, and had props put in to secure the roofs of said mentioned places.

February 11, 1898.—On this date a new 25-foot Monongahela Guible fan was started on the Blossburg mine, which is run by a 50-horsepower electric motor. The fan was running 60 revolutions per minute and I took air measurements throughout the workings of the mine. I measured 37,500 cubic feet of air entering the mine per minute, making a difference of 29,340 cubic feet of air in favor of the new fan. I then took air measurements throughout the workings and found the measurements to be as follows, viz:

	Cubic feet air.
Last crosscut between Nos. 3 and 4, left entries	5, 280
Face of diagonal entry	27, 360
Last crosscut between Nos. 13 and 14, right entries	9, 350
Last crosscut between Nos. 11 and 12, right entries	11, 230
No. 11, right entry	12, 600
Face of pillars of Nos. 9 and 10, right entries	8, 550
Return to fan	39, 000

I found the new fan had very much improved the ventilation throughout the workings of the mine. On this visit to the mine I found that the company had erected water tanks inside the mine at a point about the center of the workings; and the company were laying a pipe line from the outside of the mine to the tanks. When the pipe line is completed the water will be pumped into the tanks for the purpose of sprinkling the inside workings, also to be used in case of a fire occurring in the mine.

February 12, 1898.—I again visited the Blossburg mine for the purpose of ascertaining if the new fan was working satisfactorily. I found that the fan was running in perfect order and giving perfect satisfaction, but I ordered the superintendent to keep the old fan in place for at least two weeks, or until such time as he was satisfied with the workings of the new machinery being a perfect success.

March 24, 1898.—I again inspected the Blossburg mine. I found the roof of No. 1 right entry in a bad condition and ordered the pit boss to have the entry timbered at once. The timbers were brought into the mine and men were ordered to timber the roof near the face of the workings before mining any more coal.

March 25, 1898.—I again inspected the Blossburg mine. The fan was running 60 revolutions per minute, and I measured 34,560 cubic feet of air entering the mine per minute, and measured 36,015 cubic feet returning per minute. I found the roof of Nos. 3, 4, 5, 6, 7, and 8 rooms on No. 18 left entry in a bad and dangerous condition, and ordered the rooms timbered at once. I also found the main hauling roads to be very dusty and ordered the roads sprinkled with water.

March 26, 1898.—On this date I returned to the Blossburg mine for the purpose of ascertaining if my orders of the 25th had been complied with. I found that the work of timbering the rooms had been completed, but the hauling roads had not been sprinkled. The pit boss assured me that the hauling roads would be sprinkled on the next day (Sunday) while the mine was not in operation.

March 28, 1898.—On this date I was informed that the main pipe line of Blossburg mine, which supplies the boilers with water, had burst, and knowing that as the water got low in the boilers the fan would necessarily have to stop on account of having no steam to run the machinery, I therefore proceeded to the mine at once and ordered the pit boss to notify all the miners and others who were in the mine to get out of the mine as soon as possible. The pit boss notified the miners and had them all to come out. I then notified the pit boss not to allow any of the miners to enter the mine till the fan had been running three hours and the workings thoroughly examined by the fire bosses.

April 20, 1898.—I again inspected the Blossburg mine. I found the miners working too far in advance of the air, and ordered a crosscut driven at the face of No. 1 right entry and make connection with the air course. The pit boss instructed the miners to commence driving the crosscut at once.

April 21, 1898.—I again inspected the Blossburg mine. I measured 33,600 cubic feet of air entering the mine per minute. I then inspected Nos. 1, 2, 3, and 4 left entries. I found the ventilation good throughout the workings. While inspecting the workings above mentioned, I found a place in the back entry off from the main entry about the center of the mine where a keg of black powder had been

scattered promiscuously for a distance of 75 feet. I came to the conclusion that some person maliciously inclined must have scattered the powder with the full intent of blowing up the mine and killing every person therein, for had some innocent miner ignited the powder with his lamp a dust explosion would undoubtedly have followed, which would have caused the loss of every life in the mine. As soon as I discovered the powder I immediately had water hauled to the place, had it flooded, and had the entry cleaned of all powder and dust, and had it hauled out of the mine. The superintendent was informed of the condition so found, the great danger, etc. He immediately employed two guards whose duty it is to keep a constant watch on all the men employed in the mine, and to allow no person to enter the mine who is not employed therein, also to use every effort to ascertain the parties who were guilty of scattering the powder in the entry.

April 22, 1898.—I again inspected the Blossburg mine and took air measurements, and found the mine well ventilated.

June 24, 1898.—I again inspected the Blossburg mine. I found the miners working too far in advance of the air in No. 1 right entry, and ordered the pit boss to have a crosscut driven between No. 1 right entry and the back air course; also, ordered the face of the entry timbered.

June 25, 1898.—I again inspected the Blossburg mine. Inspected Nos. 1, 2, 3, 4, 5, and 6 left entries; also the rooms on the above-mentioned entries. The fan was running 60 revolutions per minute. I measured 26,400 cubic feet of air entering the mine per minute, and found the ventilation very good throughout the workings which I inspected. I found the workings of the mine in good condition.

June 27, 1898.—On this date I continued my inspection of the Blossburg mine. I inspected Nos. 5, 6, 7, 8, 9, and 10 right entries and the main entry. I took air measurements throughout the workings above mentioned and found the workings well ventilated. Also found the workings in good condition.

The above report on the Blossburg mine includes No. 4 and No. 6 mines, which are on the same vein and operated by the same company.

DESCRIPTION OF THE PROPERTY OF THE RATON COAL AND COKE COMPANY, INCLUDING THE NEW ELECTRIC PLANT.

Lands.—There are 10,000 acres of coal land embraced in the property of the company, in which there are several seams of coal. At present, however, only one seam is being worked by two mines, Nos. 4 and 6, both of which are drift mines located close to each other, the coal averaging from 6 to 7 feet in thickness. The mines are dry and comparatively free from gas. The coal is an excellent quality of bituminous coal, and is used quite largely in New Mexico and Arizona for steam purposes and also in the manufacture of coke.

Coke ovens.—There are at present 76 beehive coke ovens of standard size, 13 feet in diameter. There is a peculiar feature in connection with the ovens, which is quite an innovation in the West, and that is the use of a hot-air flue located between the ovens which are double row batteries, and which flue enables us to economize and utilize the waste heat for generating steam. The waste heat is conducted by means of this flue and smokestacks on the boiler to the boiler plant midway between the two batteries of ovens, and generates a large proportion of the steam power required for the operation of our electric plant. This system of utilizing the waste heat is quite largely used in the South, especially in Alabama, but only one other plant of the beehive pattern with hot-air flue being in use in the United States outside of those in Alabama and New Mexico, this being in Pennsylvania.

Power.—The mines are equipped with three generators, aggregating 500 horsepower, using a 500-volt current. The plant is of the latest improved type, modern in every respect.

Mining.—Mining is done by a plant of 8 Morgan-Gardiner electric mining machines undercutting the coal 7 feet in depth and 44 inches wide, 4 inches high; time required is about four and one-half minutes. Hauling from the partings in the mine is done by 3 electric locomotives, which are in very successful operation, economizing cost of production and facilitating a ready increase of output at all times.

Washing plant.—Washing plant consists of two 400 tons capacity each Robinson-Wiggs coal washers, with all of the latest improved appliances for washing and handling 800 tons of coal per day. At present only one washer is used, the other being held in reserve for future increase in coke ovens. The trolley line for the hauling system is of No. 2/o hard-drawn copper. There is now about 9,000 feet of trolley line in use, 3,000 feet of which runs from the mouth of the mine to the tippie. All partings along the hauling system inside of the mine are furnished with electric lights. The line material was all furnished by the Ohio Brass Company, of Mansfield, Ohio. All the machinery, large and small, is driven by electric motors.

Tipple.—The tipple is of the latest improved construction, using automatic dumping apparatus and other minor appliances, and enables the company to handle the output, if required, of 2,000 tons per day.

Ventilation.—The mines are ventilated at present by one 25-foot diameter Guibal mine fan, and the mine also has a 22-foot Guibal fan, driven by electric motor, which we have in process of erection as a reserve, so that the mine will at all times be provided with ample ventilating capacity.

Machine shop.—A large machine shop, with modern tools, has been erected for the purpose of manufacturing and repairing all the machinery on the property.

Houses.—The company has 134 dwelling houses, all new, and erected during the past year.

Store.—A large brick store, one and one-half stories, 75 by 120 feet, which is well supplied with merchandise, has also been erected during the past year.

Accidents.—The most modern system of mining is used throughout the mines, and great care is taken to prevent accidents, which are remarkably few in comparison to output and number of men employed, especial attention being given to avoiding accidents to employes.

Summary.—The property now being operated is thoroughly modern and up to date—the most complete plant of its kind in the West. All labor-saving appliances and devices have been introduced, which are now in successful operation at the plant, that are now known in the mining trade.

SMITH MINE, NO. 2.

[Henry Smith, lessee and general manager.]

This mine is located 1 mile north of the town of Raton, Colfax County, N. Mex. Owned by the Maxwell Land Grant Company and is operated under lease by Henry Smith. Kind of coal, bituminous; thickness of vein, 4 feet; total output, fiscal year, 2,972 tons; estimated value of output this year, \$5,201; length of drift, 300 feet; value of improvements this year, \$150; average number of men employed inside, 6; average number of boys employed inside, 2; where coal is marketed, town of Raton, N. Mex.; number of days mine worked, 240.

The product of this mine is hauled to the town of Raton, N. Mex., and retailed to the domestic trade. Capacity is about 10 tons per day. This mine is now ventilated by a furnace.

RECORD OF INSPECTION.

October 6, 1897.—On this date I inspected the Smith mine No. 2. I measured 2,160 cubic feet of air entering the mine per minute, and measured 2,340 cubic feet of air returning. I found the workings of the mine in good condition, and found the ventilation good throughout the workings of the mine.

December 11, 1897.—I again inspected the Smith mine No. 2. I found the workings of the mine in fair condition. At the time of my visit there were only 4 miners employed in the mine.

February 8, 1898.—On this date I again inspected the Smith mine No. 2. I measured 1,960 cubic feet of air entering the mine per minute. I found that the miners were working too far in advance of the air in Nos. 1, 2, and 3 rooms, and ordered crosscuts driven at the face of the rooms so as to force the air up to the face of the workings. The work of driving the crosscuts was commenced, and when completed the ventilation will be good throughout the workings.

March 23, 1898.—I again inspected the Smith mine No. 2. I measured 1,800 cubic feet of air entering the mine per minute, and measured 1,950 cubic feet of air returning. I found the ventilation good throughout the workings of the mine. I found the mine in good condition.

April 13, 1898.—I again inspected the Smith mine No. 2. I measured 2,100 cubic feet of air entering the mine per minute, and measured 2,275 cubic feet of air returning. I found the workings of the mine in good condition.

June 23, 1898.—On this date I again inspected the Smith mine No. 2. I measured 2,400 cubic feet of air entering the mine per minute, and measured 2,560 cubic feet of air returning through the return air course. On this visit I found the mine well ventilated and the workings in good condition.

MESA MINE.

[Thomas Griffiths, general manager.]

This mine is located about 7 miles east of Raton, Colfax County, N. Mex. Operated by Thomas Griffiths. Kind of coal, bituminous; thickness of vein, 5 feet; total output, fiscal year, 1,000 tons; estimated value of output, \$1,750; average number of employes inside, 3; average number of employes outside, 2; length of

drift, 200 feet; total value of improvements this year, \$1,000; mine in operation, 200 days.

The product of this mine is hauled to Raton, N. Mex., and retailed to the domestic trade. Capacity, about 10 tons per day. Ventilation, natural.

RECORD OF INSPECTION.

October 11, 1897.—On this date I inspected the Mesa mine. I measured 1,750 cubic feet of air entering the mine per minute. I measured 1,800 cubic feet of air returning. I found the air distributed in compliance with the law. On this date only 2 miners were employed in the mine.

February 14, 1898.—I again inspected the mine known as the Mesa mine. I inspected the underground workings of the mine and found the same in good condition. At the time of my visit to the mine only 4 miners were employed therein.

March 29, 1898.—I again inspected the Mesa mine. At the time of my visit there were only 3 miners employed in the mine. I found the workings of the mine in fair condition.

June 28, 1898.—I again inspected the Mesa mine. I measured 1,400 cubic feet of air entering the mine per minute, and measured 1,575 cubic feet of air returning through the return air course. I found the ventilation good throughout the workings of the mine and found the mine in good condition.

MONERO MINE.

[J. H. Crist, owner and general manager.]

This mine is located at Monero, Rio Arriba County, N. Mex., on the Denver and Rio Grande Railroad. Kind of coal, bituminous; thickness of veins, three in number, 3 feet 10 inches, 3 feet 8 inches, 3 feet 6 inches; total output fiscal year, 22,500 tons; estimated value of output, \$31,000; depth of slopes, mine No. 1, 1,700 feet; mine No. 2, 556 feet; mine No. 3, 500 feet; value of improvements this year, \$4,000; average number of men employed outside, 13; average number of men employed inside, 32; where coal is marketed, northern New Mexico and Colorado; number of days mines worked, 313.

The Rio Arriba Coal Company now owns and operates the three mines at Monero, and are designated as No. 1, No. 2, and No. 3 mine. Formerly No. 2 mine was owned by A. H. Willis, and No. 3 mine was owned by M. F. Simers.

RECORD OF INSPECTION.

October 27, 1897.—On this date I inspected the mine known as Monero mine. I measured 13,440 cubic feet of air entering the mine per minute, and measured 13,600 cubic feet of air per minute returning through the return air course. I found the miners in Nos. 2 and 3 right rooms working too far ahead of the air, and ordered crosscuts driven at the face of the rooms so as to give the air a chance to circulate up to the face of the workings; otherwise I found the mine in fair condition.

October 28, 1897.—On this date I inspected No. 2 slope of the Monero mine. I measured 6,000 cubic feet of air entering the slope per minute. At the time of my visit the only work being done in this mine was the driving of the slope. I found the workings in fair condition. I found that the cars were being hoisted out of the slope without using an iron drag, and ordered the superintendent to have a drag attached to the last car on every trip of cars hoisted out of the mine. This drag is attached for the purpose of derailing the cars should the rope break.

COOK & WHITE MINE.

[James Duggan, superintendent; William Brown, pit boss.]

This mine is located 3 miles south of the town of Los Cerrillos, Santa Fe County, N. Mex. Owned and operated by the Cerrillos Coal Railroad Company. Kind of coal, bituminous; thickness of vein, 3 feet 6 inches; total output fiscal year, 115,000 tons; estimated value of output, \$172,500; value of improvements this year, \$5,000; average number of men employed outside, 25; average number of men employed inside, 250; average number of boys employed inside, 10; where coal is marketed, New Mexico, Arizona, California, Old Mexico, and Texas; number of days mine worked, 278.

This mine is situated on a branch of the Atchison, Topeka and Santa Fe Railroad, which connects with the main line at Waldo Station. The product of the mine is sold to the Atchison, Topeka and Santa Fe Railroad, California, Texas, and Old Mexico, and has a capacity of 700 tons per day. This mine is ventilated by two fans.

RECORD OF INSPECTION.

September 8, 1897.—On this date I inspected the Cook & White mine. I measured 27,000 cubic feet of air entering the mine per minute, and measured 30,405 cubic feet of air returning through the return air course. I then took air measurements throughout the workings of the mine and found the air distributed as follows:

	Cubic feet of air.
Last crosscut, first left entry	8, 610
First left room in first left dip plane	2, 840
Second left room in first left dip plane	3, 000
No. 4 room on right of first left dip plane	630
No. 3 room on right of first left dip plane	2, 400
No. 2 room on right of first left dip plane	9, 450
Last crosscut between first left air course and No. 1 right room on left dip plane	12, 600
Main return above No. 2 left entry	11, 900
Face of second left main entry	7, 600
Last crosscut No. 2 left entry	14, 800
Face of No. 2 left back entry	6, 720
Last return on left of No. 2 slope	12, 250
Bottom of slope	8, 800
Last return on right of No. 2 slope	11, 560
Above lower splits, near bottom of slope	25, 850
Last crosscut between front and back entry on second right	11, 700
Last crosscut between first right back entry and first left room on first right dip plane	13, 200
Last crosscut between second and third left rooms on right dip plane	10, 125
Last crosscut between third and fourth left rooms on right dip plane	9, 360
Last crosscut between fourth and fifth left rooms on right dip plane	7, 245
Last crosscut between fifth and sixth left rooms on right dip plane	8, 660
Last crosscut between sixth and seventh left rooms on right dip plane	6, 650
Return air at bottom of right dip plane	2, 475
Face of No. 8 right room, right dip plane	2, 750
Last crosscut between Nos. 6 and 7 right rooms	7, 770
Last crosscut between Nos. 5 and 6 right rooms	8, 750
Last crosscut between Nos. 4 and 5 right rooms	7, 000
Last crosscut between Nos. 3 and 4 right rooms	6, 300
Last crosscut between Nos. 2 and 3 right rooms	9, 900
First right entry at face of workings	2, 240
Last crosscut, first right, between front and back entry	6, 825
Return at No. 3 fan	18, 720
Return at No. 1 fan	11, 685

I found the workings of the mine well timbered and in good condition.

October 14, 1897.—On this date I again inspected the Cook & White mine and took air measurements, and found the measurements to be as follows:

	Cubic feet air.
Intake	30, 000
Return at No. 1 fan	14, 760
Last crosscut between Nos. 1 and 2 left rooms on left dip plane	5, 120
Face of No. 3 left room	5, 000
Last crosscut between Nos. 3 and 4 left rooms	8, 750
Last crosscut between Nos. 4 and 5 left rooms	6, 600
Last crosscut between Nos. 5 and 6 left rooms	9, 100
Bottom of left dip plane	3, 000
Last crosscut between Nos. 1 and 2 right rooms on left dip plane	12, 700
Last crosscut between Nos. 2 and 3 right rooms	8, 400
Last crosscut between Nos. 3 and 4 right rooms	6, 000
Last crosscut between Nos. 4 and 5 right rooms	8, 775
Last crosscut between Nos. 5 and 6 right rooms	7, 395
Face of second left main entry	6, 600
Last crosscut on second left entry between front and back entry	9, 000
Face of second left entry	10, 200
Slope above lower splits	28, 700
Last return on left side of slope	12, 045
Bottom of slope	6, 975
Last return on right of slope	10, 500

October 15, 1897.—On this date I continued my inspection of the Cook & White mine and took air measurements throughout the workings as follows:

	Cubic feet air.
Face of second right entry	720
Last crosscut between front and back entry	8,550
Face of second right back entry	4,042½
Bottom of right dip plane	10,125
Last crosscut between Nos. 2 and 3 right rooms, right dip plane	4,050
Last crosscut between Nos. 3 and 4 right rooms	3,150
Last crosscut between Nos. 4 and 5 right rooms	6,270
Last crosscut between Nos. 5 and 6 right rooms	5,800
Last crosscut between Nos. 6 and 7 right rooms	7,400
Last crosscut between Nos. 7 and 8 right rooms	2,700
Last crosscut near face of first right entry	4,800
Last crosscut between first right main and No. 1 left room on second raised plane	5,600
Last crosscut between Nos. 1 and 2 left rooms	3,960
Top of second raised plane	2,160
Return at No. 3 fan	18,240

I found the workings of the mine well timbered and in good condition.

November 23, 1897.—I again inspected the Cook & White mine. I measured 39,250 cubic feet of air entering the mine per minute, and took air measurements throughout the workings of the mine and found the air distributed as follows:

	Cubic feet air.
Above lower air splits in slope	35,750
Left return near bottom of slope	15,600
Right return near bottom of slope	18,300
Face of No. 3 left entry	2,628
Last crosscut at bottom of slope to back slope	2,100
Face of second right back entry	5,880
Last crosscut between No. 2 front and back entry	12,150
Face of No. 2 right main entry	3,120
Last crosscut between Nos. 4 and 5 right rooms, right dip plane	12,920
Last crosscut between Nos. 8 and 9 right rooms	9,135
Last crosscut between Nos. 9 and 10 right rooms	6,600

November 24, 1897.—I continued my inspection of the Cook & White mine and took air measurements throughout the workings as follows:

	Cubic feet air.
Last crosscut first left entry	9,800
Last crosscut between Nos. 2 and 3 rooms, left dip plane	10,600
Bottom of left dip plane	2,100
Crosscut between Nos. 1 and 2 rooms	5,800
Air course, first right back entry	16,560
Face of first right entry	3,150
Last crosscut between front and back entry, first right	14,760
Last crosscut between first right entry and No. 1 left room on plane	1,368
Last crosscut between Nos. 3 and 4 left rooms on second raised plane	7,200
Top of No. 2 raised plane	2,400
Face of second left main entry	3,960
Last crosscut, second left main entry	7,940
Face of second left back entry	4,675
Face of No. 1 raised plane	3,744
Return at No. 3 fan	21,700
Return at No. 1 fan	14,350
Intake, this date	35,000

I found the workings of the mine in good condition.

December 16, 1897.—I again inspected the Cook & White mine. I measured 44,000 cubic feet of air entering the mine per minute, and measured 37,400 cubic feet of air traveling above the lower air splits on the slope.

	Cubic feet air.
Left return near bottom of slope	11,395
Right return near bottom of slope	18,200
Bottom of slope	11,500

I found the air distributed throughout the workings in compliance with the law, and found the workings in good condition.

December 17, 1897.—I continued my inspection of the Cook & White mine. I found the miners working too far in advance of the air in the second left entry and ordered a crosscut driven between the main and back entry, so as to force the air up to the face

of the workings. In all other working places in the mine I found the ventilation good. The crosscut was commenced, and as soon as completed I would consider the mine in good condition.

January 21, 1898.—On this date I inspected the machinery of the Cook & White mine and found the machinery in good condition.

January 22, 1898.—I inspected the workings of the Cook & White mine which are located on the left side of the main slope, and took air measurements, which I found to be as follows:

	Cubic feet air.
Intake.....	41, 750
Return on left side at No. 1 fan.....	20, 000
Last crosscut near face of first left entry.....	15, 345
Last crosscut between Nos. 1 and 2 left rooms, first left dip plane.....	4, 800
Last crosscut between Nos. 2 and 3 left rooms.....	3, 500
Last crosscut between Nos. 7 and 8 right rooms.....	8, 800
Last crosscut between Nos. 9 and 10 right rooms.....	6, 600
Last crosscut between Nos. 5 and 6 left rooms.....	4, 000
Last crosscut on second left main entry.....	5, 250
Face of second left back entry.....	6, 100
Face of second left main entry.....	5, 125
Above lower air splits.....	38, 500
Left return on main slope, near bottom of slope.....	12, 540
Bottom of slope.....	5, 580
Face of lowest crosscut on main to back slope.....	3, 840
Right return on main slope, near bottom.....	19, 760

January 24, 1898.—I continued my inspection of the Cook & White mine and took air measurements on the right side of the slope, as follows:

	Cubic feet air.
Last crosscut on second right entry.....	15, 200
Face of second right back entry.....	3, 465
Face of second right main entry.....	6, 240
Face of No. 11 left room, first right dip plane.....	3, 120
Crosscut between Nos. 10 and 11 left rooms.....	10, 320
Face of No. 10 left room.....	3, 600
Crosscut between—	
10 and 11 right rooms, first right dip plane.....	10, 220
9 and 10 right rooms, first right dip plane.....	4, 810
8 and 9 right rooms, first right dip plane.....	11, 880
7 and 8 right rooms, first right dip plane.....	11, 900
6 and 7 right rooms, first right dip plane.....	13, 750
5 and 6 right rooms, first right dip plane.....	11, 900
4 and 5 right rooms, first right dip plane.....	2, 860
Face of first right main entry.....	1, 875
Last slant between first right front and back entries.....	12, 000
Last crosscut between first left raised plane and first right entry.....	9, 000
Crosscut between—	
Nos. 1 and 2 left rooms, second raised plane.....	7, 830
Nos. 2 and 3 left rooms, second raised plane.....	8, 640
Nos. 3 and 4 left rooms, second raised plane.....	5, 580
Nos. 4 and 5 left rooms, second raised plane.....	5, 400
Nos. 5 and 6 left rooms, second raised plane.....	4, 350
Nos. 6 and 7 left rooms, second raised plane.....	2, 240
Face of No. 8 left room, second raised plane.....	800
Crosscut between—	
Nos. 6 and 7 right rooms, second raised plane.....	2, 240
Nos. 4 and 5 right rooms, second raised plane.....	1, 400
Return to No. 3 fan.....	28, 800
Main intake on this date.....	43, 500

I found the workings of the mine to be well ventilated and found some carburated hydrogen gas at the face of the second right back entry and ordered a crosscut driven between the front and back entries. The crosscut was commenced at once.

January 26, 1898.—On this date the miners who were working in the second left entry of the Cook & White mine reported the finding of some carburated hydrogen gas at the face of the entry. I immediately went down the mine into where the gas was reported and found some gas generating at the face of the entry. I ordered the canvas brattice extended up to the face of the workings, and ordered a crosscut driven from the face of the main entry to the back entry, and ordered the last crosscut bratticed up, so as to force all the air to the face of the workings. After this work had been completed the gas disappeared.

January 29, 1898.—On this date I was informed that the crosscuts in the second right and second left entries of the Cook & White mine had been completed. I again went down into the mine and found that the crosscuts had been driven according to my orders of the 24th and 26th.

I measured 9,470 cubic feet of air traveling at the face of the second left entry and found very little gas in the entry. I measured 16,920 cubic feet of air traveling in the crosscut at the face of the second right entry and found no gas in the front or back entries. I ordered the superintendent to allow nothing but safety lamps to be used in places where the slightest particle of carbureted hydrogen gas was known to exist.

February 17, 1898.—I again inspected the underground workings of the Cook & White mine. I measured 35,000 cubic feet of air entering the mine per minute, and took air measurements throughout the workings, which were as follows, viz:

	Cubic feet air.
Last crosscut between first left main and back entry	8,000
Face of second left main entry	4,085
Last crosscut between second left main and back entry	4,860
Face of second left back entry	2,880
Second left air course, outside of No. 1 slant	7,700
Second left back entry, outside of No. 2 slant	9,890
Above air splits near bottom of slope	33,000
Bottom of slope	14,400
Last return on right of slope	15,750
Last return on left of slope	11,400
Face of second right entry	6,130
Crosscut, second right entry	14,630
Face of second right back entry	4,250

February 18, 1898.—On this date I continued my inspection of the Cook & White mine and inspected the workings on the right side of the main slope; also inspected the bottom of the slope. I found a small amount of carbureted hydrogen gas at the bottom of the slope and ordered the canvas brattice extended up to the face of the workings. I then took air measurements as follows:

	Cubic feet air.
Last crosscut between first right main and back entry	9,230
Face of first right main entry	4,970
Face of first right back entry	6,840
Last crosscut between No. 1 left room and first right main entry	9,860
Last crosscut between Nos. 1 and 2 left rooms, on No. 1 raised plane	8,000
Last crosscut between Nos. 2 and 3 left rooms	7,525
Face of No. 1 raised plane	2,500
Last crosscut between Nos. 7 and 8 left rooms	4,100
Last crosscut between Nos. 6 and 7 right rooms	1,120
Return at No. 3 fan	27,000
Return at No. 1 fan	16,800

I found the workings of the mine to be well ventilated and found the mine in fair working condition.

March 15, 1898.—I inspected the hoisting machinery, fans, ropes, and boilers belonging to the Cook & White mine, and found the machinery in good condition.

March 16, 1898.—On this date I again inspected the workings on the left side of the slope of the Cook & White mine. Also the bottom of the slope and the second right entries. I measured 39,750 cubic feet of air entering the mine per minute. I measured 18,000 cubic feet of air traveling at the bottom of the slope. I discovered a small amount of carbureted hydrogen gas in No. 3 right entry, which had been started near the bottom of the slope, and I ordered the canvas brattice extended up to the face of the workings of said entry.

March 17, 1898.—I continued my inspection of the Cook & White mine. I inspected No. 1 right entries, also the rooms on No. 2 right raised plane. I found the workings which I inspected in good condition and found the ventilation good throughout the workings.

March 18, 1898.—I again inspected the workings at the bottom of the slope and No. 3 right entry. I found that the canvas brattice had been extended up to the face of the workings of No. 3 right entry according to my instructions of March 16, and found that the gas had disappeared from the entry. I then inspected No. 1 right entries, also the rooms on No. 2 right raised plane. I found the places above mentioned in good condition and found the ventilation good throughout the workings.

April 11, 1898.—On this date I inspected all of the safety lamps which were being used in the Cook & White mine. I found the lamps in good condition.

April 13, 1898.—I inspected the Cook & White mine. I measured 40,000 cubic feet of air entering the mine per minute, and measured 34,100 cubic feet of air travel-

ing at the bottom of the slope. I found a small quantity of gas at the bottom of the slope, also at the face of the third right entry, and had the canvas brattice extended up to the face of the workings and removed the gas. I also inspected the main air courses and found them in good condition.

April 14, 1898.—I continued my inspection of the Cook & White mine. I inspected the rooms of Nos. 1 and 2 raised planes and found them well ventilated. Found the workings well timbered and in good condition.

April 15, 1898.—On this date I inspected No. 1 left dip plane of the Cook & White mine and the rooms thereon. I found the ventilation good throughout the workings and found the rooms well timbered and in fair condition.

April 16, 1898.—On this date I inspected the rope which is used for hoisting the loaded cars out of the Cook & White mine. I found the rope in bad condition, being much worn in one place. I called the superintendent's attention to the rope, and he informed me that he would have the rope attended to on Sunday when the mine was not being operated.

June 14, 1898.—I again inspected the machinery of the Cook & White mine and found that nothing had been done with main hauling rope on the Cook & White mine and ordered the superintendent to replace the old rope with a new one as soon as possible. The superintendent informed me that a new rope had been ordered and would be put in place just as soon as it arrived, and on Sunday, 18th, the new rope was put in place.

June 15, 1898.—On this date I commenced the inspection of the underground workings of the Cook & White mine, and while inspecting the mine, about 9 o'clock a. m., a miner informed me that a fire had been discovered in room No. 9 on the first right dip plane. I immediately went down the dip plane to where the fire was reported, and after looking the situation over had a force of men put to work extending the pipe line from the main pipe line to the place where the fire had occurred. After the pipe line had been extended I caused a hose to be attached to the pipe line. I then had the pump started, and with a force of men commenced the work of extinguishing the fire. A force of men was also employed to work all night and hold the fire in check. On the morning of the 16th I again visited the place where the fire was and found that very little progress had been made in extinguishing the fire, and found it a very difficult matter to handle. I worked all this day with men in trying to extinguish the fire. I also had a force of men ordered to work all that night and keep a constant stream of water on the fire. On the morning of the 17th I again visited the place where the fire had originated and found that the fire had been almost extinguished and wholly under control, and at about 2 p. m. no signs of fire could be seen. I then ordered that all debris in rooms 9 and 10 be loaded into pit cars and hauled out of the mine. This work was commenced at once.

June 18, 1898.—On this date I inspected the underground workings of the Cook & White mine and took air measurements. The air measurements on this date were as follows:

	Cubic feet air.
Intake.....	40,000
No. 1 right entry.....	10,800
Crosscut, second raised plane.....	9,360
No. 3 left room, No. 2 raised plane.....	6,840
No. 5 left room, No. 2 raised plane.....	5,775
No. 7 left room, No. 2 raised plane.....	3,360
First raised plane on second right entry.....	6,300
Last crosscut, face of second right entry.....	8,990
Third left entry, near bottom of slope.....	3,920
Right back slope.....	21,440
Left back slope.....	8,500
Above air splits near bottom of slope.....	26,000
Back air course, second left entry.....	7,800
Last crosscut between front and back entries, second left.....	4,350
Bottom of second left raised plane.....	3,000
Return at No. 1 fan.....	18,000
Return at No. 3 fan.....	24,000

I found the ventilation good throughout the workings of the mine, and found the mine in fair working condition.

June 22, 1898.—On this date I was informed by a miner that considerable gas had accumulated in rooms 9 and 10 on the first right dip plane, where the fire had originated. I immediately visited the above-mentioned rooms and found considerable gas in room No. 9. I measured the air which was traveling between rooms 9 and 10 and found only 750 cubic feet of air traveling per minute, which was not sufficient to sweep the gas away. The air course was very small and I ordered the air course enlarged, so that a sufficient quantity of air could travel through the air course and sweep the gas away and render it harmless. The work of enlarging the

COAL MEASURES
NEAR LOS CERRILLOS
SANTA FE, CO. N.M.

NO SCALE
G.L. HUMPHREYS

SEVERAL SMALL SEAMS
NOT FULLY PROSPECTED
APPEAR FARTHER UP
THE CANYON

UPPER ANTHRACITE

QUARTZITE OVERFLOW 50'

COAL 1' 8"
SLATE & SANDSTONE 6' 0"

SHALES & SANDSTONE 80' 0"

COAL 4' 0"

SHALES & SANDSTONE 40' 0"

COAL 2' 6"

air course was commenced at once, and before the miners came out in the evening the gas had all disappeared.

This mine generates considerable carburated hydrogen gas, but the superintendent uses every precaution to avoid accidents happening in the mine, and everything possible is done to protect the lives of the miners.

WHITE ASH MINE.

[James Duggan, superintendent; William Graham, pit boss.]

This mine is located about 2½ miles south of the town of Los Cerrillos, Santa Fe County, N. Mex. Owned and operated by the Cerrillos Coal Railroad Company. Kind of coal, bituminous; thickness of vein, 5 feet 6 inches; total output fiscal year, 108,000 tons; estimated value of output, \$162,000; value of improvements this year not given; average number of men employed outside, 23; average number of men employed inside, 100; average number of boys employed, 4; where coal is marketed, New Mexico, Arizona, Mexico, and Texas; number of days mine worked, 278.

This mine is situated on a branch line of the Atchison, Topeka and Santa Fe Railroad, which connects with the main line at Waldo Station. Capacity, about 400 tons per day. This mine is ventilated by a 15-foot Guible fan. All the pillars in this mine have been drawn to within 500 feet of the surface, and the probabilities are that the mine will be worked out within six months and closed down.

RECORD OF INSPECTION.

September 9, 1897.—On this date I inspected the underground workings of the White Ash mine. The fan was running 90 revolutions per minute, and I measured 36,960 cubic feet of air entering the mine per minute, and measured 40,000 cubic feet of air returning through the return air course. I then took air measurements throughout the workings of the mine and found the air distributed as follows:

	Cubic feet air.
Bottom of slope	22,200
Back slope	6,090
Right side of slope	10,760
Between third and fourth left entries	14,040
Between second and third left entries	11,160
Between first and second left entries	20,000
Bridge overcast, return from left side of slope	21,300

I found the workings of the mine in good condition and found the mine well ventilated.

October 16, 1897.—I again inspected the White Ash mine. I measured 38,550 cubic feet of air entering the mine per minute, and measured 41,200 cubic feet of air returning. I found the air distributed throughout the workings as follows:

	Cubic feet air.
Face of second left entry	20,000
Face of third left entry	12,420
Face of third right entry	9,600
Bottom of slope	25,200
Back slope	9,240
Bridge overcast, air from left side of slope	23,700

I ordered the pit boss to keep the miners well supplied with props in order to secure their working places, as the only work being done in this mine is the drawing of pillars.

November 22, 1897.—I again inspected the White Ash mine. The fan was running 80 revolutions per minute, and I measured 30,120 cubic feet of air entering the mine per minute, and measured 31,000 cubic feet of air returning. I found the ventilation good and found the workings of the mine in fair condition.

December 15, 1897.—I again inspected the White Ash mine. The fan was running 80 revolutions per minute, and I measured 31,360 cubic feet of air entering the mine per minute, and measured 31,500 cubic feet of air returning. I found some timbers broken in the second left entry and ordered new timbers put in. I also ordered the miners to keep drill holes 12 feet in length ahead of any new workings in the mine. This was done in order to keep from breaking through into old workings, which are supposed to have been made in the mine several years ago and are supposed to have large bodies of water therein.

December 21, 1897.—On this date I again visited the White Ash mine to ascertain if the miners were keeping drill holes ahead of the new work, according to my orders of December 15. I found the miners obeying my orders, and found two company men working with a diamond drill so as to keep holes drilled from 50 to 100 feet in advance of any new workings.

January 21, 1898.—On this date I inspected the machinery of the White Ash mine. I found the water in the boilers very dirty, and ordered the boilers to be blown out and cleaned as soon as possible. I was informed that the work would be done on Sunday, when the mine was not working. The work was performed.

January 26, 1898.—On this date I again inspected the underground workings of the White Ash mine and took air measurements. The fan was running 83 revolutions per minute, and I measured 41,860 cubic feet of air entering the mine per minute, and measured 49,600 cubic feet of air returning through the return air course. I found the workings of the mine well ventilated and found the mine in good condition.

February 16, 1898.—I again inspected the underground workings of the White Ash mine. The fan was running 80 revolutions per minute and I measured 38,400 cubic feet of air entering the mine per minute and measured 43,875 cubic feet of air returning through the return air course. I found the workings of the mine well ventilated and found the mine in good condition.

March 15, 1898.—On this date I inspected the hoisting machinery, fans, ropes, and boilers belonging to the White Ash mine and found the same in good condition.

March 19, 1898.—On this date I again inspected the White Ash mine. The fan was running 82 revolutions per minute, and I measured 28,000 cubic feet of air entering the mine per minute. I then took air measurements throughout the workings of the mine and found a sufficient quantity of air traveling in the working places to comply with the law. I found a small quantity of carbureted hydrogen gas at the face of the entry known as the left dip entry, and had the brattice extended up to the face of the entry. After this was done the gas soon moved from the face of the entry and I considered the mine in good condition.

April 12, 1898.—I again inspected the underground workings of the White Ash mine. The fan was running 83 revolutions per minute, and I measured 41,560 cubic feet of air entering the mine per minute and measured 42,240 cubic feet of air returning per minute. I found the ventilation very good throughout the workings of the mine and found the workings of the mine in good condition.

June 14, 1898.—I again inspected the machinery of the White Ash mine and found the same in good condition.

June 20, 1898.—I again inspected the White Ash mine. The fan was running 83 revolutions per minute, and I measured 35,530 cubic feet of air entering the mine per minute and measured 36,840 cubic feet of air returning through the return air course. I found the air distributed throughout the workings in accordance with the law and found the workings in good condition.

LUCAS MINE.

[James Duggan, superintendent; William Brown, pit boss.]

Located 3 miles south of the town of Los Cerrillos, Santa Fe County, N. Mex. Owned and operated by the Cerrillos Coal Railroad Company. Kind of coal, anthracite; thickness of vein, 3 feet 9 inches; total output fiscal year, 25,000 tons; estimated value of output at mine, \$100,000; depth of slope, 1,200 feet; value of improvements this year not given; average number of men employed outside, 40; average number of men employed inside, 100; average number of boys employed inside, 2; where coal is marketed, New Mexico, Arizona, California, Colorado, and Kansas; number of days mine worked, 177.

This mine is located on a branch of the Atchison, Topeka and Santa Fe Railroad, which connects with the main line of the road at Waldo Station, and has a capacity of about 450 tons per day. The mine is ventilated by a double 6-foot Murphy fan.

RECORD OF INSPECTION.

September 11, 1897.—On this date I inspected the Lucas mine. At the time of my visit to the mine it was not being operated. I inspected the underground workings and found them in good condition.

October 18, 1897.—I inspected the workings of the Lucas mine, which are located on the left side of the main slope. The only work being done on the left side of the mine was the drawing of pillars. I found the workings in fair condition.

October 19, 1897.—On this date I continued my inspection of the Lucas mine and took air measurements. I measured 15,800 cubic feet of air entering the mine per minute and measured 16,800 cubic feet of air per minute returning through the return air course. I found the mine well ventilated and found the workings well timbered and in good condition.

October 20, 1897.—On this date I inspected the old workings of the Lucas mine and found no gas (fire damp) in the old, abandoned workings and found the air courses in good condition.

November 26, 1897.—On this date I again inspected the Lucas mine. The fan was

running 140 revolutions per minute, and I measured 11,000 cubic feet of air entering the mine per minute and measured 12,250 cubic feet of air returning through the return air course. I found the air distributed in compliance with the law, and found the workings of the mine in fair condition.

November 29, 1897.—On this date I inspected the machinery of the Lucas mine. I found that the fan was being run at 110 revolutions per minute, its regular speed being 150 revolutions, and I ordered the fan speeded up to 150 revolutions per minute.

December 18, 1897.—I again inspected the Lucas mine. The fan was running 180 revolutions per minute, and I measured 15,920 cubic feet of air per minute entering the mine and measured 16,450 cubic feet of air returning through the return air course. I measured 7,875 cubic feet of air traveling at the bottom of the slope.

	Cubic feet air.
Last crosscut in fourth right entry.....	1,920
Last crosscut in third right entry.....	2,400
Last crosscut, second left right entry.....	3,520

I found the mine in fair working condition.

January 27, 1898.—On this date I inspected the main hauling slope and Nos. 2, 3, and 4 right entries of the Lucas mine. I measured 16,800 cubic feet of air entering the mine per minute and measured 18,275 cubic feet of air returning. I found the air distributed throughout the workings of the mine in compliance with the law, and found the mine in good condition.

January 28, 1898.—I continued my inspection of the Lucas mine. I inspected No. 1 right entry and found the entry in good condition. I also inspected the hoisting engine, boilers, and ropes belonging to the Lucas mine and found the same in good condition.

March 21, 1898.—I again inspected the Lucas mine. The mine was not being operated on this date, but I examined the air courses and main entries and found the same in good condition. I also found the machinery in good condition.

June 21, 1898.—I again inspected the Lucas mine. I measured 9,130 cubic feet of air entering the mine per minute. I then measured the air just below the fourth right entry, and found only 3,150 cubic feet of air traveling per minute. I ordered that all stoppings along the slope be made air-tight, so as to conduct more air into the fourth right entry. At the time of my visit to the mine there were only 18 miners employed therein.

CARTHAGE MINE.

[Hilton & Luerra, operators.]

Located about 12 miles southeasterly direction from San Antonio, Socorro County, N. Mex. Kind of coal, soft bituminous; thickness of vein, 4 feet 6 inches; total output, fiscal year, 1,500 tons; estimated value of output, \$3,000; depth of slope, 2,200 feet; value of improvements this year, \$1,000; average number of men employed outside, 2; average number of men employed inside, 2; where coal is marketed, Socorro, San Marcial, Belem, and Magdalena, N. Mex.; number of days mine worked, 200.

The coal is hauled in wagons and shipped from San Antonio, N. Mex., to the different towns above mentioned along the Atchison, Topeka and Santa Fe Railroad. This mine has a capacity of about 50 tons per day and is ventilated by an air shaft. There is considerable development work done on the mine, and the coal is of a very good character, but having to haul 12 miles in wagons is too great an expense to compete with other mines which are situated on lines of railroad.

RECORD OF INSPECTION.

September 27, 1897.—On this date I inspected what is known as the Carthage Coal Company mine. I measured 1,750 cubic feet of air entering the mine per minute, and measured 1,787½ cubic feet of air returning per minute through the outcast. I found the main entry had been driven too far without a crosscut, and ordered a crosscut driven from the face of the main entry to the main return air way. At the time of my visit the mine was not being operated, but Mr. Givani Luerra informed me that he expected to do considerable work during the winter months.

EMPLOYES.

The following tabulated statement shows the number of miners, day men, and boys employed in and about the coal mines of the Territory:

Counties.	Miners.	Boys.	Day men.	Total.
Bernalillo.....	792	14	118	924
Colfax.....	209		152	361
Lincoln.....				
Rio Arriba.....	32		13	45
San Juan.....				
Santa Fe.....	450	16	88	554
Socorro.....	2		2	4
Total.....	1,485	30	373	1,888

In the column headed day men are included all men employed in and around the mines in any capacity except those actually engaged in mining.

During the fiscal year 1897-98 the total number of employees as reported to me by the various mining companies was one thousand eight hundred and eighty-eight (1,888), an increase of employees of five hundred and twenty-three (523), as against the number employed in the previous year.

Production of coal.

Name of mine.	Men employed.		Tons of coal mined.		Estimated value of product, 1897-98.
	1896-97.	1897-98.	1896-97.	1897-98.	
<i>Bernalillo County.</i>					
Beacon Hill		3		600	\$1,080
Caledonia	43		20,900		
Catalpa	7	68		4,356	8,000
Canavan & Bailey	10	8	3,100	800	1,200
Crown Point	165	156	42,333	61,194	92,000
Gallup	208	269	109,270	141,145	220,000
Otero	52	177	31,470	90,366	138,049
Rocky Cliff	33	35	15,500	22,000	33,000
Sunshine	49	125	58,364	48,480	80,000
W. A. Clark		80		3,500	4,000
Mulholland & Casna		6		200	400
Total	567	927	275,937	372,611	575,729
<i>Colfax County.</i>					
Blossburg	350	360	200,000	210,000	357,500
Mesa	5	5	1,200	1,000	1,750
Smith No. 2	7	8	2,067	2,972	5,201
Total	362	373	203,267	213,972	364,451
<i>Rio Arriba County.</i>					
Monero Nos. 1, 2, and 3	23	45	18,000	22,500	31,000
<i>Socorro County.</i>					
Carthage	2	4	1,224	1,500	3,000
<i>Santa Fe County.</i>					
Cook & White	100	285	98,500	115,000	172,500
Lucas	172	142	83,000	75,000	100,000
White Ash	97	127	93,900	108,000	162,000
Total	369	554	225,400	248,000	434,500

Production of coal—Continued.

RECAPITULATION.

County.	Output for fiscal year.	Estimated value.	Percentage of output for Territory.
	<i>Tons.</i>		<i>Per cent.</i>
Bernalillo.....	372, 611	\$575, 729	43. 398
Colfax.....	213, 972	384, 451	24. 922
Santa Fe.....	248, 130	434, 500	28. 884
Rio Arriba.....	22, 500	31, 000	2. 632
Socorro.....	1, 500	3, 000	. 174
Total.....	858, 583	1, 408, 680	100. 000

Analysis of coal from the White Ash Mine of the Cerrillos Coal Railroad Company.

[Made by W. D. Church, December 2, 1893.]

COAL FROM MADRID, N. MEX., WHITE ASH MINE.

Water.....	per cent..	2. 00
Volatile matter.....	do.....	39. 00
Fixed carbon.....	do.....	53. 76
Mineral ash.....	do.....	5. 24
Total.....	do.....	100. 00
Coke.....	do.....	59. 00
Character of coke, strong and tough.		
Color of ash, light yellowish gray.		
Character of ash, soft and light.		
Sulphur (as sulphide).....	do.....	. 010
Sulphur (as sulphate).....	do.....	. 022
Phosphorus.....	do.....	. 006
Specific gravity.....	do.....	1. 410
One cubic foot weighs.....	pounds..	88. 125

Analysis of mineral ash:

Silica.....	per cent..	26. 93
Alumina.....	do.....	32. 41
Oxide of iron.....	do.....	3. 96
Calcium oxide.....	do.....	24. 68
Magnesium oxide.....	do.....	10. 32
Calcium sulphate.....	do.....	. 21
Alkalies, and loss.....	do.....	1. 49

Total.....do.....100. 00

COAL FROM RATON COAL AND COKE COMPANY.

Water.....	per cent..	. 75
Volatile matter.....	do.....	34. 40
Fixed carbon.....	do.....	56. 93
Mineral ash.....	do.....	7. 92
Total.....	do.....	100. 00
Coke.....	do.....	64. 85
Character of coke, very strong and tough.		
Color of ash, very light ocher.		
Character of ash, soft and light.		
Sulphur (as sulphide).....	do.....	. 016
Sulphur (as sulphate).....	do.....	. 022
Phosphorus.....	do.....	. 014
Specific gravity.....	do.....	1. 291
One cubic foot weighs.....	pounds..	88. 690

Analysis of mineral ash:

Silica.....	per cent..	44. 16
Alumina.....	do.....	39. 28
Oxide of iron.....	do.....	2. 95
Calcium oxide.....	do.....	7. 41
Magnesium oxide.....	do.....	3. 27
Sulphate of calcium.....	do.....	. 41
Alkalies, and loss.....	do.....	2. 52

Total.....do.... 100.00

From the column of percentages of production it will be seen that the output of coal from the Territory comes practically from four counties.

For the fiscal year ending June 30, 1898, there were reported 20 mines in operation, 4 less than during the previous year.

The production for the fiscal year 1897 and 1898 was 858,583 tons. This is an increase of production of 125,044 tons.

During the fiscal year there were reported to me as mine inspector 7 fatal accidents, the causes of which were as follows: By falls of rock, 3; falls of coal, 2; runaway cars, 1; firing blast, 1.

The following table shows the number of tons of coal mined for each life lost:

County.	Tons mined.	Lives lost.	Tons of coal mined to each life lost.
Bernalillo.....	372, 611	1	372, 611
Colfax.....	213, 972	1	213, 972
Santa Fe.....	248, 000	5	49, 600

The nonfatal accidents reported to me as mine inspector during the fiscal year were as follows: By falls of rock, 8; pit cars, 4; unclassified, 2.

The following table shows the number of tons of coal mined to each nonfatal accident:

County.	Tons mined.	Accidents.	Tons of coal mined to each nonfatal accident.
Bernalillo.....	372, 611	4	93, 152. 8
Colfax.....	213, 972	2	106, 986
Santa Fe.....	248, 000	8	31, 000

ACCIDENTS.

Table of accidents of a fatal character reported to me as mine inspector for the fiscal year ending June 30, 1898.

Where accident occurred. Name of mine.	Date.	Name.	Character of injury.	Cause of death.
Blossburg mine, Blossburg, N. Mex.	Nov. 25, 1897	Wm. Sartoris.....	Skull crushed.....	Fall of coal.
Gallup mine, Gallup, N. Mex....	Mar. 3, 1898	Franz Dellazer ...	Fracture of part pubic bone.	Do.
Cook & White, Madrid, N. Mex.	Feb. 19, 1898	Bathisti Desidero.	Head completely mashed.	Do.
Do.....	Nov. 16, 1897	Benjamin Mar- tinez.	Fractured base of skull.	Do.
Do.....	Mar. 26, 1898	Antonio Vignasa.	Skull crushed.....	Do.
Do.....	Apr. 8, 1898	John Foster.....	Fracture of six ribs penetrat- ing lungs.	Struck by a piece of coal in firing shot.
White Ash mine, Madrid, N. Mex.	Dec. 5, 1897	J. H. Curley.....	Compound frac- ture of right leg and scalp wound.	Runaway car.

RECORD OF FATAL ACCIDENTS.

November 25, 1897.—At Blossburg mine, William Sartoris, a miner, an Italian, age 45 years, had his skull and face crushed, and died almost immediately. Cause: The deceased was at work mining coal (undercutting) when coal fell on him, crushing his skull and face, producing death in about one hour. Left wife and eight children. No coroner's jury.

FATAL ACCIDENT—GALLUP MINE.

March 3, 1898.—Franz Dellazer, Austrian, age 37 years, was injured by a fall of rock, which caused his death. Cause: The deceased had his room in good condition, but a small piece of rock, close up against the coal face in the nature of a pot and feathered edge slip, dropped out without any warning, striking him, causing a fracture of the pubic bone, with internal injuries caused by part of the bone penetrating the intestines, also probable rupture of bladder. The deceased lived about seven hours after receiving the above injuries. No coroner's jury.

FATAL ACCIDENTS—COOK & WHITE MINE.

February 19, 1898.—At Cook & White mine, Bathisti Desidero, an Italian, age 35 years, had his head completely mashed, and died immediately. Cause: Fall of rock at face of his room. Number in family: Wife and two children. No coroner's jury.

November 16, 1897.—At the Cook & White mine, Benjamin Martinez, age 20 years, had his skull fractured; died in twenty minutes after the injury. Cause: He was taking down some rock in the face of his room, and after working at it for about an hour he gave it up and thought it was safe, and commenced taking out coal when the rock gave way and caught him, injuring him so he lived only twenty minutes. No coroner's report.

March 26, 1898.—Antonio Vignasa, Italian, age 32 years, was crushed by a fall of rock and instantly killed at Cook & White mine. No coroner's jury.

April 8, 1898.—At Cook & White mine, John Foster, an "Englishman," was injured at about 8.30 o'clock a. m.; and died at 2.30 p. m. Cause: He was found 34 feet back in the entry behind a canvas curtain. He had put in a shot and retired when the explosion occurred. A piece of coal weighing about 15 pounds struck him in the side with fatal effect, causing a fracture of six ribs in right side, commencing third downward, the end of which perforated the lungs. Number in family: Wife and one child. No coroner's jury.

FATAL ACCIDENT—WHITE ASH MINE.

December 5, 1897.—J. H. Curley, Irishman, age 25 years, received a compound fracture of right leg, junction lower and middle third, also extreme lacerated wound under side of right knee joint, and scalp wound about the size of a silver dollar on crown of head. Cause: In letting down cars from the plane the miners place a prop upright from top to bottom of place where they are working; this should be put up secure enough to hold when the weight of the loaded car, which is let down the plane by means of a rope being put around the prop; but it seems that the deceased failed to make the prop secure and it came down. The man got entangled in the rope and received the injury, as stated above. He was removed to the hospital at Santa Fe, and died on December 8, 1897, at 12 o'clock midnight.

TABLE OF NONFATAL ACCIDENTS.

Name of mine.	Date.	Name.	Character of injury.	Cause.
Blossburg, Gardiner, N. Mex.	June 22, 1898	Antonio Lucero . . .	Back broken.	Fall of rock.
Do	Dec. 24, 1897	Jesus Gonzales . . .	Leg broken.	Do.
Cook & White, Madrid, N. Mex.	Sept. 23, 1897	Anton Bianchi . . .	Left leg broken. . . .	Do.
Do	June 16, 1898	John Brown	Partial dislocation of back.	Do.
Do	July 7, 1897	John Tomasco	Two scalp wounds	Shot went off on him.
Do	do	Emil Leplat	Severe contusion of right ankle joint.	Engineer jerked the trip.
White Ash, Madrid, N. Mex.	Dec. 5, 1897	Elesio Mitchletti . .	Simple fracture of right leg.	Runaway car.
Do	do	A. Mitchletti	Right leg broken . . .	Do.
Do	Nov. 1, 1897	Thos. Thomas	Left leg broken. . . .	Fall of rock.
Lucas Mine, Madrid, N. Mex.	Mar. 9, 1898	John Beirman	Sprained back	Do.
Otero Mine, Gallup, N. Mex.	Jan. 5, 1898	August Alary	Leg dislocated. . . .	Foot caught in loaded car.
Do	Jan. 18, 1898	Peter Golino	Struck in eye with pick.	Carelessness.
Do	June 9, 1897	Jas. Martinez	Leg broken.	Fall of rock.
Sunshine, Gallup, N. Mex.	Feb. 25, 1898	Ed. Crisen	Double fracture of leg.	Do.

RECORD OF NONFATAL ACCIDENTS.

December 24, 1897.—At Blossburg mine, Jesus Gonzales, a laborer, age 40 years, was injured by a fall of slate rock weighing about 200 pounds. He was working with mining machine when the rock fell on him, breaking his leg.

June 22, 1898.—At Blossburg mine, Antonio Lucero, Mexican, age 32 years, was injured by a fall of rock, having his back broken. Cause: He was loading coal by the ton, and did not examine the roof before commencing work. The rock fell on him while in a stooping position, and broke his back. On August 5 I received a letter from the acting superintendent of the mine advising me that the man was still living.

September 23, 1897.—At the Cook & White mine, Anton Bianichi, an Italian, age 34 years, was injured by having his left leg broken. Cause: He was working in the first right dip plane, and was caught by a fall of rock, breaking his leg.

June 16, 1898.—At Cook & White mine, John Brown, Scotchman, age 50 years, was injured in the first left dip plane. Cause: Was caught by a fall of rock, causing partial dislocation of back.

July 7, 1897.—At Cook & White mine, Emil Leplat, Frenchman, age 26 years, was injured in No. 1 right entry. Cause: Engineer jerked the trip suddenly and caught him, causing severe contusion of right ankle joint, fracture right fibula in lower third.

July 7, 1897.—At Cook & White mine, John Tomasoo, Italian, age 35 years, was injured in No. 2 plane. Cause of injury: Shot went off on him, causing two scalp wounds—one over right frontal bone, 6 inches long, and one 4 inches long above and to right of occipital protuberance.

November 1, 1897.—At White Ash mine, Thomas Thomas, a native of Wales, age 27 years, was injured in No. 3 right entry. Cause: Was caught by a fall of rock, breaking his left leg.

December 5, 1897.—At White Ash mine, Elesio Mitchletti, Italian, age 30 years, was injured in second left plane on second left entry. Cause: He got entangled in a rope while letting down a pit car loaded with coal and received a simple fracture of the right leg in middle third.

March 9, 1898.—At the Lucas mine, John Beirman, German, age 43 years, was injured at face of No. 2 raised plane. Cause: A fall of rock caught him, spraining his back.

January 18, 1898.—At Otero mine, Peter Golino, Italian, age 48 years, was injured by a piece of coal striking him in the eye.

January 5, 1898.—At Otero mine, August Alary, a native of France, age 30 years, had his leg dislocated. Cause: He was dropping car from face of room and was in front of it; tried to get out of the way of the car, but was caught and fell, dislocating leg.

February 28, 1898.—At the Otero mine, James Martines, Mexican, age 28 years, was injured by having his thigh bone broken. Cause: He was undercutting coal with a pick when a piece of the roof fell on him and broke his thigh.

February 25, 1898.—At Sunshine mine, Ed. Crisen, Italian, age 25 years, was injured in slope (air course). Cause: He was mining coal when a piece of the roof known as a pot slip fell on him, causing a double fracture of his leg.

Table showing name of mine, method of working, ventilation, power, etc.

Name of mine.	Method of working.	Ventilation.	Power.
Beacon Hill.....	Slope, double entry, room and pillar.....	Furnace.....	Steam.
Canavan & Bailey.....	Slope, single entry, room and pillar.....	.....do.....	Do.
Crown Point.....	Double compartment shaft.....	Fan.....	Do.
Gallup.....	Slope, double entry, room and pillar.....	.....do.....	Do.
Otero.....	Drift, single entry, room and pillar.....	Furnace.....	Do.
Rocky Cliff.....	.....do.....	.....do.....	Horse.
Sunshine.....	Slope, double entry, room and pillar.....	Fan.....	Steam.
Blossburg.....	Drift, double entry, room and pillar.....	.....do.....	Do.
Mesa.....	Drift, single entry, room and pillar.....	Air shaft.....	Horse.
Smith No. 2.....	.....do.....	Furnace.....	Do.
Monero Nos. 1, 2, and 3.....	Slope, single entry, room and pillar.....	.....do.....	Steam.
Carthage.....	.....do.....	Air shaft.....	Horse.
Cook & White.....	Slope, double entry, room and pillar.....	Two fans.....	Steam.
Lucas.....	.....do.....	Fan.....	Do.
White Ash.....	.....do.....	.....do.....	Do.
Catalpa.....	.....do.....	Furnace.....	Do.
W. A. Clark.....	.....do.....	Natural.....	Do.
Mulholland & Casna.....	Slope, single entry, room and pillar.....	Air shaft.....	Horse.

AIR MEASUREMENTS.

The following table shows the number of cubic feet of air per minute entering the mines and returning, measured at intake and outlet:

Name of mine.	Date.	Intake.	Outlet.	Name of mine.	Date.	Intake.	Outlet.
Otero	Sept. 18, 1897	4,500	5,000	Monero	Oct. 27, 1897	13,440	13,600
	Nov. 11, 1897	10,290	10,550	Monero No. 2	Oct. 28, 1897	6,000	
	Jan. 11, 1898	12,080	12,406	Cook & White	Sept. 8, 1897	27,000	30,405
	Mar. 11, 1898	8,050	8,400		Oct. 14, 1897	30,000	
Gallup	Sept. 21, 1897	24,000	24,075		Oct. 15, 1897		33,000
	Nov. 15, 1897	30,000	30,300		Nov. 23, 1897	39,250	
Sunshine	Sept. 16, 1897	27,840	25,200		Nov. 24, 1897	35,000	36,050
	Nov. 13, 1897	26,460	26,250		Dec. 16, 1897	44,000	
	Jan. 12, 1898	28,600	28,800		Jan. 21, 1898	41,750	39,760
	Mar. 9, 1898	40,000	41,000		Jan. 24, 1898	43,500	43,200
Crown Point	Sept. 17, 1897	16,060	16,800		Feb. 17, 1898	35,000	
	Nov. 12, 1897	17,920	18,000		Feb. 18, 1898		43,800
	Jan. 13, 1898	19,950	21,840		Mar. 16, 1898	39,750	
	Mar. 12, 1898	19,950	20,540		Apr. 13, 1898	40,000	
Rocky Cliff	Sept. 15, 1897	6,300	6,475	White Ash	June 18, 1898	40,000	42,000
	Nov. 16, 1897	2,730	3,040		Sept. 9, 1897	36,960	40,000
	Jan. 10, 1898	6,500	6,550		Oct. 16, 1897	38,550	41,200
	Mar. 9, 1898	5,510	6,450		Jan. 25, 1898	41,860	49,600
Mulholland & Casna	Jan. 14, 1898	4,600			Feb. 16, 1898	34,400	43,875
Blossburg	Oct. 9, 1897	8,400			Mar. 19, 1898	28,000	
	Dec. 9, 1897	18,840	19,040		Apr. 12, 1898	41,560	42,240
	Feb. 10, 1898	8,160			June 20, 1898	35,530	36,840
	Feb. 11, 1898	37,500	39,000	Lucas	Oct. 19, 1897	15,800	16,800
	Mar. 25, 1898	34,560	36,015		Nov. 26, 1897	11,000	12,250
	Apr. 21, 1898	33,600	34,200		Dec. 8, 1897	15,920	16,450
	June 25, 1898	26,400	27,000		Jan. 27, 1898	16,800	18,275
Smith Mine No. 2	Oct. 6, 1897	2,160	2,340	Carthage	June 21, 1898	9,130	
	Feb. 8, 1898	1,960	2,180		Sept. 27, 1897	1,750	1,787
	Mar. 23, 1898	1,800	1,950				
	Apr. 19, 1898	2,100	2,275				
	June 23, 1898	2,400	2,560				
Mesa	Oct. 11, 1897	1,750	1,800				
	June 28, 1898	1,400	1,575				

MINES NOT INSPECTED.

During the fiscal year I have written letters several times to coal-mine operators in San Juan and Lincoln counties, N. Mex., requesting that a report of the mines be forwarded to me, giving the production, number of men employed, etc., but I have received no reply. Owing to the location of the mines being a great distance from the railroad, and only a very few if any men being employed, and only during the winter months, I did not deem it necessary to inspect the properties. In former years there were not more than 7 or 8 men employed in either San Juan or Lincoln counties.

MINES NOT IN OPERATION.

Green & Bailey mine, Santa Fe County, not operated this year.
 Hartsell mine, Colfax County, not operated this year.
 Mulholland mine, Bernalillo County, not operated this year.
 Smith mine No. 1, Colfax County, not operated this year.
 Sterling mine, Rio Arriba County, not operated this year.
 Waldo mine, Santa Fe County, not operated this year.
 Miller Gulch mine, Santa Fe County, not operated this year.

NEW MINES OPENED THIS YEAR.

W. A. Clark mine, Bernalillo County.
 Mulholland & Casna mine, Bernalillo County.

Prices paid for labor, mining coal, etc., by the Crescent Coal Company, Gallup, N. Mex.

Mining coal per ton of 2,000 pounds, screened coal.....	\$0.70
Driving entry	per yard.. 2.00
Room turning.....	4.00
Crosscuts.....	per yard.. 1.50
Timbers.....	per set.. .50
Company men under ground	per day.. 3.00
Boys attending to doors	do.. 1.00
Engineers	per month.. 80.00
Boiler men	per day.. 2.25
Tipple men	do.. 3.00
Blacksmiths	do.. 3.00
Blacksmiths' helpers.....	do.. 2.50
Carpenters	do.. 3.00

Prices of powder and supplies for miners, Crescent Coal Company.

Powder	per keg.. \$4.00
Lamp oil	per gallon.. 1.25
Lamp cotton	per ball.. .05
Squibs	per box.. .25

Prices paid for labor, mining coal, etc., by Cerrillos Coal Railroad Company, at Madrid, N. Mex.

Mining coal per ton of 2,000 pounds, screened—	
White ash	\$0.70
Cook & White .....	.85
Lucas .....	.90
Driving main entry	per yard.. 3.00
Driving back entry	do.. 1.75
Driving crosscuts	do.. 1.50
Driving main slope when in natural coal.....	do.. 6.00
Driving main slope when in faults or solid rock	do.. 9.00
Driving raised planes.....	do.. 1.75
Turning rooms off entry and driving room, 30 feet.....	8.00
Setting rough 7-foot timbers.....	1.00
Setting timbers over 7 feet in length.....	2.00
Setting 7-foot props.....	.07
Wages paid—	
Plt bosses.....	per day.. 3.00
Fire bosses.....	do.. 3.00
Track layers	do.. 2.75
Company timbermen.....	do.. 2.75
General company men.....	do.. 2.60
Single mule drivers.....	do.. 2.60
Team drivers	do.. 2.75
Rope riders.....	do.. 3.00
Car couplers.....	do.. 2.75
Assistants to company men	do.. 2.00

Prices of powder and supplies for miners of the Cerrillos Coal Railroad Company.

Powder	per keg.. \$2.60
Lamp oil	per gallon.. .85
Lamp cotton	per ball.. .05
Squibs	per box.. .25

WHITE ASH MINE.

Statement of work done in the White Ash mine for the fiscal year ending June 30, 1898.

Name of entry.	Length.		Number of rooms.		Remarks.
	Total feet.	Driven since June 30, 1897.	Total feet.	Turned since June 30, 1897.	
Main slope	3,465	.....	.....	.....	Pillars pulled to within 1,100 feet of mouth.
First north	700	.....	9	.....	Abandoned prior to July 1, 1897.
Second north	1,587	.....	21	.....	All pillars pulled.
Third north	2,010	.....	25	.....	Do.
Fourth north	2,170	.....	28	.....	Do.
Fifth north	1,655	.....	22	.....	Do.
Sixth north	1,540	.....	19	.....	Do.
Seventh north	1,844	.....	14	.....	Do.
Eighth north	1,332	.....	11	.....	Do.
Ninth north	1,060	.....	7	.....	Do.
Tenth north	840	.....	17	.....	Do.
First south	1,000	.....	15	.....	Abandoned prior to July 1, 1897.
Second south	1,960	.....	21	.....	Pillars pulled back to main slope.
Third south	1,960	.....	22	.....	Do.
Fourth south	1,210	.....	14	.....	Do.
Fifth south	670	.....	7	.....	Do.
Sixth south	560	.....	5	.....	Do.
Seventh south	270	.....	4	.....	Do.
Eighth south	200	.....	.....	.....	Do.
New entry above first south	900	900	7	7	Stopped June 30, 1898; starting back on pillars.

New entry driven north above old first north, a distance of 1,100 feet; 20 rooms turned and pillars drawn back to within 600 feet of main slope, and all work done since June 30, 1897.

LUCAS MINE.

Statement of work done in the Lucas mine for the fiscal year ending June 30, 1898.

Name of entry.	Length.		Number of rooms.		Remarks.
	Total feet.	Driven since June 30, 1897.	Total feet.	Turned since June 30, 1897.	
Main slope	1,400	.....	.....	.....	Main return for air.
First north	260	.....	4	.....	Pillars pulled to within 275 feet of slope.
Second north	980	.....	15	.....	Pillars pulled to within 250 feet of slope.
Third north	810	.....	12	.....	Do.
Fourth north	570	.....	6	.....	Do.
Fifth north	100	.....	.....	.....	Pillars pulled to within 1,000 feet of slope.
First south	1,700	.....	24	.....	Entry being further developed.
Second south	2,628	723	29	2	Entry not driven since Jan., 1898.
Third south	1,522	260	19	3	Entry being further developed.
Fourth south	1,971	900	21	10	Entry not driven since Sept., 1897.
Fifth south	500	.....	5	.....

COOK & WHITE MINE.

Statement of work done in the Cook & White mine for the fiscal year ending June 30, 1898.

Name of entry.	Length.		Number of rooms.		Remarks.
	Total feet.	Driven since June 30, 1897.	Total feet.	Turned since June 30, 1897.	
Main slope	1,814	270	14	.....	Stopped Apr. 1, 1898; new slope being driven 800 feet north.
New slope.....	320	320	.....	.....	.....
First north.....	1,282	.....	36	30	Entry stopped; all rooms finished; no pillars pulled.
Second north.....	2,170	1,703	10	10	Stopped temporarily.
Third north.....	210	210	.....	.....	Being further developed.
First south.....	4,047	1,627	76	38	12 rooms working.
Second south.....	2,442	1,886	6	6	Being further developed.
Third south.....	471	471	.....	.....	Do.

PRODUCTION OF COKE.

All the coke produced in the Territory was produced at the Blossburg mine, Gardiner, Colfax County, N. Mex.

The amount produced was 2,275 tons during the fiscal year. Very little coke was produced during the year on account of the coal washers not being completed till very late in fiscal year.

The coke produced was shipped and sold to the different smelting plants in the Territory of Arizona.

GENERAL REMARKS.

The thickness of the veins in nearly all of the mines where fire damp is generated is favorable to their proper ventilation, and while gas can not be prevented from generating, it could undoubtedly be prevented in the entries and rooms by having proper ventilation; also by crosscuts being driven more closely together, thus sweeping the gas out as fast as it generates.

Every superintendent and pit boss should make it his imperative duty to provide ventilation as the work advances, and he should not delay until he is compelled to make the proper provisions by allowing gas to form so as to cause severe and disastrous explosions.

Proper care and provisions and the knowledge that "eternal vigilance is the price of safety" would be a safeguard to the investments of the owner, and security for the life and limbs of those employed in the mines.

There are no Territorial laws governing the coal industries; and when the importance of the subject is properly represented before the Territorial legislature, certain restrictions should be placed on the manner of handling powder, as well as to ventilation and other matters, which would insure greater safety and protection to the miners and other persons connected with this growing industry.

In all the coal mines throughout the Territory the mine officials have expressed their willingness to comply with all requirements of the United States laws governing coal mining, and the main problem which confronts the mine inspector is to get the miners impressed with the necessity of looking out for themselves and use ordinary precaution in their own behalf.

A coal miner of experience needs no prompting or hints that the roof of his entry or room is in bad condition, and he should not need to be compelled to put in the necessary posts or timber to insure his protection; and carelessness in this respect often not only jeopardizes his life, but works to the injury of other miners and to the detriment of the management.

There may be some of the workmen or miners who would like to express their opinions relative to the ventilation or workings of the mine, and probably some would wish to accompany the mine inspector on his tour through the mines. This the inspector would heartily indorse, and would suggest that the miners select one of their number to accompany him through the mine while inspecting. A complaint may be made that the inspector on visiting the mine always asks for the superintendent or pit boss. There are two reasons why the inspector goes to the superintendent or pit boss.

In the first place, the miner does not wish to lose a day or so of work; and the second reason is that the pit boss is a responsible party for all defects in the working of the mine, and is the proper person for the inspector to give instructions and orders

to relative to ventilation and timbering at any point that the inspector thinks needs regulating.

But what would materially assist the inspector in the performance of his duty would be for the miners or workmen to adopt a system of reporting the condition of the mine to the inspector. This plan would probably result in a material benefit to the workmen and could result in no injury to those concerned who intended to comply with the law, and would have a tendency to compel those who are careless to do their duty.

Some of the workmen may say that they are afraid to complain to the inspector for fear of being discharged; but this should not be allowed. The inspector has a right to question the workmen, and they should feel that they have a right to furnish information required by the inspector.

INSTRUCTIONS AND RULES.

under which Cerrillos Coal Railroad Company mines are to be governed, and all fire bosses will observe the same:

First. Do not remain off of duty without giving foreman due notice, so that he can put a man in your place.

Second. On beginning your shift's work, your regular daily route will be: Commencing at mouth of slope, travel to face, and return from lower entry in slope to the upper entry in same, making a regular travel in all air courses, and examine all places, including abandoned as well as working places, in each entry, with Davy safety lamp, or such other improved lamp as may be in use at the time.

Third. If you find the brattice or canvas shot down or damaged, repair it at once, so as to conduct the air to the face of the workings as soon as possible, and report in every instance where canvas is shot down to the foreman.

Fourth. Report in writing all places where gas is found; also verbally to foreman.

Fifth. If air courses are obstructed in any way by water or rock, etc., report same in writing, and verbally to foreman, that he may remedy it at once.

Sixth. Where roof of air course is bad, and looks dangerous and should be timbered or taken down, report same daily in writing, and verbally to foreman.

Seventh. Do not allow any man to go into his place with naked light where standing gas is found or being generated freely. Give him a locked safety lamp and instruct him to use it instead of naked light until further advised by you. Any person that you find disobeying this rule report same to foreman at once, and he will be discharged from the employment of the company.

Eighth. If you should find a large quantity of gas at any time in the mine between shifts, report same at once to foreman and do not allow the men to go farther down the slope than lamp house, and the foreman will know from your report how to instruct further.

Ninth. Quantities of gas found in places on account of brattice or canvas shot down should always be removed by the fire boss, and not allow the men to enter the place until the gas is removed.

Tenth. Instruct men who are working with safety lamps to brush all gas from their places before firing shots.

Eleventh. Any fire found in the mine from shot firing, or otherwise, must be put out promptly, and call for assistance from any point if you are unable to extinguish it yourself.

Twelfth. Examine and clean all safety lamps thoroughly after every shift's use, and do not allow any defective lamps to be taken from the lamp house.

Thirteenth. Any lamps that are damaged by persons using them, or if they fail to return them at the expiration of each shift, report same to foreman and damages will be charged against them.

Fourteenth. Report all places to foreman where you think there is not a sufficient flow of air traveling to prevent the accumulation of gases.

Fifteenth. Travel the main return air-ways daily without fail.

Sixteenth. Put the danger mark (XX) at the entrance of all places that contain standing gas.

RULES GOVERNING THE CERRILLOS COAL RAILROAD COMPANY MINE FANS.

First. The fireman will attend to the fans when the engineers are off duty.

Second. The engineer when on duty will have full charge of fans and see that they are attended to.

Third. On commencing the shift's work, visit the fans and see whether they are in good order or not.

Fourth. If you find any of the fans in bad order, notify the master mechanic at once.

Fifth. Do not stop the fan for any slight adjustment while men are in the mine.

Sixth. If either fan should get out of order so that it is necessary to stop it, close

the trapdoor near the fan immediately after stopping the fan, and open trapdoor immediately when the fan is started up again.

Seventh. Notify the foreman before you stop either or both of the fans.

Eighth. Do not stop both fans at one time while men are in the mine unless you see that they will be totally destroyed by continuing to run them, and not then until you notify foreman to get men out of the mine.

Ninth. If a sudden breakdown should take place, or you should find one of the fans stopped, notify the foreman at once, then close the trapdoor, and notify the master mechanic.

Tenth. In case of breakdown of either of the fans, and master mechanic is not close at hand, the engineer and firemen must do everything that they can to get the fan in operation again as soon as possible.

Eleventh. Fans are to be kept speeded as per verbal instructions given to you from time to time by the master mechanic or superintendent.

Twelfth. Visit the fan every hour and notice if all the working parts are in good order.

Thirteenth. Notice the speed of the fan every thirty minutes.

Fourteenth. If anything occurs to the boilers or steam-pipe connections, or if a sufficient quantity of steam can not be kept up for both fans and hoist plant, stop hoisting till such time as you can recover and maintain the usual pressure of steam.

Names and addresses of superintendents or managers or pit bosses.

Name of mine.	Post-office.	Officer.
Beacon Hill.....	Gallup, N. Mex.....	T. A. Fabro, manager.
Sunshine .....	.....do	Hugh McGinn, superintendent; W. Weaver, general manager.
Canavan & Bailey .....	.....do	Stephen Canavan, manager.
Rocky Cliff.....	.....do	Do.
Otero.....	.....do	Alex. Bowie, general manager; John Steward, superintendent.
Crown Point.....	.....do	Hugh McGinn, superintendent; W. Weaver, general manager.
Catalpa.....	.....do	Do.
Gallup.....	.....do	Do.
W. A. Clark .....	.....do	W. L. Brotherton, superintendent.
Mulholland-Casna .....	.....do	Gus Mulholland, manager.
White Ash	Madrid, N. Mex.....	James Duggan, superintendent; C. M. Higginson, vice-president, Chicago, Ill.
Lucas .....	.....do	Do.
Cook & White.....	.....do	Do.
Blossburg	Raton, N. Mex.....	Jas. A. Wiggs, superintendent; Harry Whigham, general manager.
Smith mine No. 2.....	.....do	Henry Smith, manager.
Mesa .....	.....do	Thos. Griffiths, manager.
Carthage	San Antonio, N. Mex..	Hilton & Luerra, managers.
Monero, Nos. 1, 2, and 3....	Monero, N. Mex.....	J. H. Crist, manager.

OFFICE OF JOHN W. FLEMING,
U. S. COAL-MINE INSPECTOR FOR THE TERRITORY OF NEW MEXICO,
Silver City, N. Mex., August 20, 1898

To the Honorable SECRETARY OF THE INTERIOR,
Washington, D. C.

SIR: In accordance with your request of the 13th day of July, 1898, I beg leave to make report of the steps taken by me to carry out the provisions of an act of Congress, approved March 3, 1891, entitled "An act for the protection of the lives of miners in the Territories."

The mining officials throughout the Territory have done everything which I have requested of them relative to the sanitary conditions of the miners and the ventilation of the mines. I have no reason to complain seriously of poor ventilation. In some instances I have found that the air was not properly distributed or not forced to the face of the working places, but upon my calling attention to the same it was at once remedied. It has been proven to me that it is the aim of the mine owners to fully comply with the requirements of the mining laws. The general conditions of the mines are improving rapidly. In mines where no second outlet had been driven the same has been done. I may add that all the mines that I have inspected have the second outlet. The roadways are kept sprinkled to avoid dust explosions, and safety lamps are used in all places where gas is known to generate, and the miners are supplied with sufficient props and timbers to secure their working places against all danger.

The general condition of the mines is improving steadily and the number of mines in operation is 20; those not in operation, 8; new mines in the course of development and producing, 2.

The production of coal for the fiscal year ending June 30, 1898, is as follows: Gallup, Bernalillo County, 372,611 tons; Madrid, Santa Fe County, 248,000 tons; Raton and Blossburg, Colfax County, 213,972 tons; Monero, Rio Arriba County, 22,500 tons; Carthage, Socorro County, 1,500 tons; total number of tons reported to me, 858,583.

Total number of fatal accidents, 7, as follows:

Cause: By falls of rock, 3; by falls of coal, 2; by runaway car, 1; by being struck by a piece of coal from shot, 1.

Total number of nonfatal accidents, 14, from the following causes: From falls of rock, 8; by runaway cars, 2; by premature shot, 1; from miscellaneous causes, 3.

The total number of men employed in and about the coal mines of the Territory for the fiscal year, as reported to me as mine inspector, were 1,888, as follows: Miners, 1,485; boys, 30; day men, 373; being an increase of employees of 523, as against the number employed in the previous year.

RECOMMENDATIONS.

Deeming the present law governing the mining industry as inadequate, I beg leave to offer a few suggestions in the way of amendments thereto, as I have suggested and recommended in my previous reports.

First. That the owner or operator of each coal mine employing ten or more men should make, or cause to be made, an accurate map or plan of the workings of such coal mine on a scale not exceeding 100 feet to 1 inch, showing the bearings and distances of workings and the general inclinations of the strata or any material deflections in such workings, and the boundary lines of such coal mines, which shall be kept for the use of the inspector at the office of said mine in the county where such mine is located; and shall also furnish a true copy of such map or plan to the inspector of coal mines, to be filed in his office; and said owner or agent shall cause to be made, on or before the 10th day of January and July of every year, a statement showing the workings of the coal mine or mines. If the agent or owner of any coal mine shall neglect or refuse, or for any cause fail, for the period of one month after the time described, to furnish said map or plan as above required, or if the inspector should find or have reasons to believe the map or plan was inaccurate in any material part, that he be authorized to cause a correct map or plan of the actual workings of such coal mine to be made at the expense of the owner thereof.

Second. The owner or agent of any coal mine, whether shaft, slope, or drift, shall provide and maintain for every such mine an amount of ventilation not less than 150 cubic feet (where fire damp is known to exist) per minute per person employed in such mine, and also an amount of ventilation of not less than 500 cubic feet per minute for each mule or horse used in such mine, which shall be distributed throughout the mine in such a manner as to dilute and render harmless and expel the noxious and poisonous gases from each and every working place in the mine. Break-throughs or air ways should be driven at least every 60 feet, or closer if deemed necessary by the inspector, and an air way or break-through be made at the face of each and every abandoned room or entry. All break-throughs, except those last named near the working face of the mine, shall be closed up and made air-tight by brattice, trapdoor, or otherwise, so that the current of air in circulation in the mine may sweep to the interior of the mine where the persons employed in such mine are at work.

Third. Within twenty-four hours after abandonment of any working face in the mine all tracks, ties, and other material, if any, should be taken out, and all entrances and approaches to that particular place should be bratticed up or filled in with "goaf", except openings for ingress and egress of air; and in these two openings, immediately in the openings and not in the room and working face, danger signals should be placed in such a manner that an intruder could not avoid seeing them.

Fourth. All mines to be provided with artificial means of ventilation necessary to provide a sufficient quantity of air, such as fanning or suction fans, exhaust steam furnaces, or other contrivances of such capacity and power as to produce and maintain an abundant supply of air; but in case a furnace shall be used for ventilation purposes it shall be built in such a manner as to prevent the communication of fire to any part of the works, by lining the upcast with any incombustible material for a sufficient distance up from said furnace. All mines generating fire damp shall be kept clear from standing gas, and every working place shall be carefully examined every morning with a safety lamp by a competent person or persons before any of the workmen are allowed to enter the mine, and the persons making such examinations shall mark on the face of the workings the day of the month, and report the condition of the mine at or near the pit top to the superintendent or pit boss; and in all the mines, whether they generate fire damp or not, the doors used in assist-

ing or directing the ventilation of the mine shall be so hung and adjusted that they will shut up of their own accord and can not stand open. The owner or agent shall employ a practical and competent overseer, to be called a mining boss, who shall keep a careful watch over the ventilating apparatus and the air ways, traveling ways, pumps, timber, and drainage; also shall see that as the miners advance their excavations all loose coal, slate, and rock overhead are carefully secured against falling in on the traveling ways, and that sufficient props and caps of suitable length and size are furnished for the places where they ought to be used and placed in the working places of the miners. He should measure the ventilation at least three times per week at the inlet and outlet, and also near the face of all entries. A record on properly printed blanks should be kept for such measurements, and at the end of each week the mine inspector should be mailed a copy.

Fifth. The mining boss, or other competent person, should make daily inspections of ropes, chains, cages and other hoisting apparatus, guides and shaft timbers, and make a record of such daily inspection in a book kept in the office of such mine for that purpose. The mine boss should keep a daily record of any defect in the ventilating appliances and any standing gas that may be found in the mine, designating the entry and room in which the gas has been found. The record of the aforesaid inspection shall be kept open at all times for the inspection of the mine inspector

Respectfully submitted.

JOHN W. FLEMING,

United States Mine Inspector for the Territory of New Mexico.

LAWS GOVERNING THE WORKINGS OF COAL MINES IN THE TERRITORIES.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in each organized and unorganized Territory of the United States wherein are located coal mines the aggregate annual output of which shall be in excess of one thousand tons per annum, the President shall appoint a mine inspector, who shall hold office until his successor is appointed and qualified. Such inspector shall, before entering upon the discharge of his duties, give bond to the United States in the sum of two thousand dollars, conditioned for the faithful discharge of his duties.

SEC. 2. That no person shall be eligible for appointment as mine inspector under section one of this act who is not either a practical miner or mining engineer, and who has not been a resident for at least six months in the Territory for which he shall be appointed; and no person who shall act as land agent, manager, or agent of any mine, or as mining engineer, or be interested in operating any mine in such Territory, shall be at the same time an inspector under the provisions of this act.

SEC. 3. That it shall be the duty of the mine inspector provided for in this act to make careful and thorough inspection of each coal mine operated in such Territory, and to report at least annually upon the condition of each coal mine in said Territory with reference to the appliances for safety of the miners, the number of air or ventilating shafts, the number of shafts or slopes for ingress or egress, the character and condition of the machinery for ventilating such mines, and the quantity of air supplied to the same. Such report shall be made to the governor of the Territory in which such mines are located, and a duplicate thereof forwarded to the Secretary of the Interior, and in case of an unorganized Territory directly to the Secretary of the Interior.

SEC. 4. That in case the said mine inspector shall report that any coal mine is not properly constructed or not furnished with reasonable and proper machinery and appliances for the safety of the miners and other employees, it shall be the duty of the governor of such organized Territory, it shall be the duty of the Secretary of the Interior, to give notice to the owners or managers of said coal mine that the said mine is unsafe, and notifying them in what particular the same is unsafe, and requiring them to furnish or provide such additional machinery, slopes, entries, means of escape, ventilation, or other appliances necessary for the safety of the miners and other employees within a period to be in said notice named, and if the same be not furnished as required in such notice, it shall be unlawful after the time fixed in such notice for the said owners or managers to operate said mine.

SEC. 5. That in all coal mines of the Territories of the United States the owners or managers shall provide at least two shafts, slopes, or other outlets, separated by natural strata of not less than one hundred and fifty feet in breadth, by which shafts, slopes, or outlets distinct means of ingress and egress shall always be available to the persons employed in said mine. And in case of the failure of any coal mine to be so provided, it shall be the duty of the mine inspector to make report of

such facts, and thereupon notice shall issue, as provided in section four of this act and with the same force and effect.

SEC. 6. That the owners or managers of every coal mine at a depth of one hundred feet or more shall provide an adequate amount of ventilation of not less than fifty-five cubic feet of pure air per second, or thirty-three hundred cubic feet per minute, for every fifty men at work in said mine, and in like proportion for a greater number, which air shall by proper appliances or machinery be forced through such mine to the face of each and every working place, so as to dilute and render harmless and expel therefrom the noxious or poisonous gases; and all workings shall be kept clear of standing gas.

SEC. 7. That any mine owner or manager who shall continue to operate a mine after failure to comply with the requirements of this act and after the expiration of the period named in the notice provided for in section four of this act, shall be deemed guilty of a misdemeanor, and shall be fined not to exceed five hundred dollars.

SEC. 8. That in no case shall a furnace shaft be used or for the purpose of this act be deemed an escape shaft.

SEC. 9. That escape shafts shall be constructed in compliance with the requirements of this act within six months from the date of the passage hereof, unless the time shall be extended by the mine inspector, and in no case shall said time be extended to exceed one year from the passage of this act.

SEC. 10. That a metal speaking-tube from the top to the bottom of the shaft or slope shall be provided in all cases, so that conversation may be carried on through the same.

SEC. 11. That an improved safety-catch shall be provided and sufficient cover overhead on every carriage used in lowering or hoisting persons. And the mine inspector shall examine and pass upon the adequacy and safety of all such hoisting apparatus.

SEC. 12. That no child under twelve years of age shall be employed in the underground workings of any mine, and no father or other person shall misrepresent the age of anybody so employed. Any person guilty of violating the provisions of this section shall be guilty of a misdemeanor, and upon conviction thereof shall be fined not to exceed one hundred dollars.

SEC. 13. That only experienced and competent and sober men shall be placed in charge of hoisting apparatus or engines, and the maximum number of persons who may ascend or descend upon any cage or hoisting apparatus shall be determined by the mine inspector.

SEC. 14. That it shall be lawful for any inspector to enter and inspect any coal mine in his district and the working machinery belonging thereto, at all reasonable times, but so as not to impede or obstruct the working of the mine; and to make inquiry into the state of the mine, works, and machinery, and the ventilation and mode of lighting the same, and into all matters and things connected with or relating to the safety of the persons employed in or about the same, and especially to make inquiry whether the provisions of this act are complied with; and the owner or agent is hereby required to furnish means necessary for such entry, inspection, examination, and inquiry, of which the said inspector shall make an entry in the record in his office, noting the time and material circumstances of the inspection.

SEC. 15. That in all cases of fatal accident a full report thereof shall be made by the mine owner or manager to the mine inspector, said report to be in writing and made within ten days after such death shall have occurred.

SEC. 16. That as a cumulative remedy, in case of the failure of any owner or manager of any mine to comply with the requirements contained in the notice of the governor of such Territory or the Secretary of the Interior, given in pursuance of this act, any court of competent jurisdiction, or the judge of such court in vacation, may, on the application of the mine inspector in the name of the United States and supported by the recommendation of the governor of said Territory or of the Secretary of the Interior, issue an injunction restraining the further operation of said mine until such requirements are complied with, and in order to obtain such injunction no bond shall be required.

SEC. 17. That wherever the term "owner or manager" is used in this act the same shall include lessees or other persons controlling the operation of any mine, and in case of the violation of the provisions of this act by any corporation, the managing officers and superintendents, and other managing agents of such corporation, shall be personally liable and shall be punished as provided in act for owners and managers.

SEC. 18. That the mine inspectors provided for in this act shall each receive a salary of two thousand dollars per annum, and their actual traveling expenses when engaged in their duties.

SEC. 19. That whenever any organized Territory shall make or has made provision by law for the safe operation of mines within such Territory, and the governor of

such Territory shall certify said fact with a copy of said law to the Secretary of the Interior, then and thereafter the provisions of this act shall no longer be in force in such organized Territory, but in lieu thereof the statute of such Territory shall be operative.

Approved, March 3, 1891.

SHEEP.

That "the hoof of the sheep is golden" has been demonstrated conclusively in New Mexico. Not even Australia, renowned the world over as the sheep growers' paradise, can surpass New Mexico in its advantages as an ideal sheep-breeding and woolgrowing section. The master hand of nature lavishly supplied our Territory with everything requisite for the successful pursuit of the sheep and wool industry. Nature endowed her with a peerless climate, neither hot nor cold, year overflowing with sunshine from January to December, producing an atmosphere pure, ozone laden, and invigorating.

Her grazing lands extend from the plains and mesas to the top of the mountains, 10,000 feet high, and bountifully covered with nature's choicest nourishment—grama grass—which retains to a surprising degree its succulence and nutrition, even when only cured by wind and weather, where it grew, and with no assistance from mankind.

New Mexico's natural adaptability to sheep raising and woolgrowing was recognized by the Spaniards when they settled in this section about three hundred years ago, and they introduced large numbers of Merino sheep, which soon became the principal support of the people, furnishing them with food and raiment. Since that time this industry has occupied a prominent position in the Territory, and it is to-day, as it has been for many years past, the most important and profitable in New Mexico.

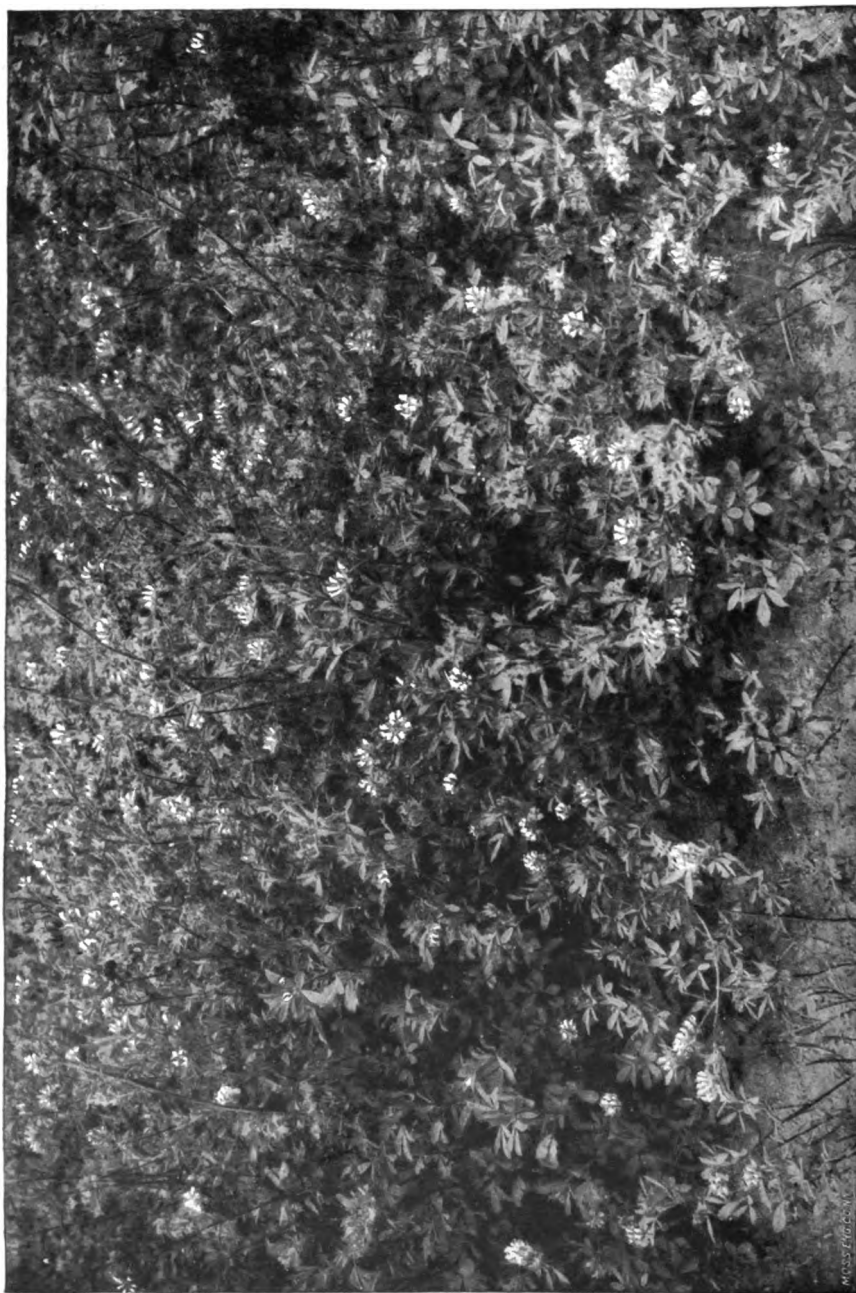
At this time there are owned within the borders of the Territory over 4,000,000 head of sheep, including the lambs grown this year, and with the exception of one State possessing many similar natural advantages, our Territory towers above all other States and Territories in the number of sheep owned.

The original stock was of the Spanish Merino type of sheep, and from lack of fine-bred rams to keep up and improve the strain they gradually deteriorated in character, until they became a class unto themselves, displaying more of the characteristics of wild than of domestic animals. This trait developed in these sheep an ability to hunt for their food, and enabled them to subsist upon scanty herbage and to live without water for many days whenever conditions demanded or necessitated such modes of living. To-day, though improved by the best blooded stock to be found, they still possess these desirable characteristics.

The ewes make excellent mothers, caring for their lambs in a manner unequalled by any other breed of sheep, and fearlessly defending them against attack by carnivorous wild animals. Their fecundity is also remarkable, and there is always a high percentage of lambs born, running up, in some flocks, over 100 per cent. Possessing such qualities the increase and growth of the flocks is very rapid.

With their inherited and acquired knowledge of the sheep business it would be difficult to find in any other section of the country a class of growers who can excel the New Mexican sheep men in the intelligent and economical management of their herds.

In the improvement of their flocks they have experimented with different breeds, and the results have convinced our best sheepmen that, for the conditions prevailing in New Mexico, the American Merino, of



ALFALFA IN BLOOM.

the Delaine or Rambouillet types, is superior to all other breeds tried, and for the purpose of raising the standard of their sheep they have imported many fine-bred rams from Vermont, Pennsylvania, Ohio, and Michigan, for some of which as high as \$100 per head was paid.

The fine types are peculiarly suited to New Mexico, not simply because they are wool and mutton sheep, but for the reason that sheep in our Territory are grazed upon open ranges, and it is therefore essential that the sheep should possess the quality of herding together, and this is a leading trait of the Merino. Some of the long-wooled mutton breeds have been tried, but as these sheep will not stay "bunched" while feeding it is very difficult to herd on the open ranges, and their decided tendency to wander off singly demands unceasing vigilance as well as hard and tiresome work on the part of the herders to hold them together, while the danger of loss from this cause is always serious, and these sheep are therefore not well suited for open-range grazing.

The Rambouillets, however, being of pure Merino descent, have inherited the flocking qualities of their ancestors, and they are a desirable class for range work. They are free from wrinkles, the wool produced is of the finest quality, and they make excellent sheep for mutton purposes.

We know not whether it is due to the climate, to the grama grass, or to the breeding, yet the fact remains that the mutton from New Mexican sheep possesses a sweetness, tenderness, and delicacy of flavor that puts them easily in the front rank as choice mutton sheep. These qualities are so well known that "feeders" prefer them to any others, and the demand for them for feeding pens is so great that the growers are only partially able to supply it. Nearly a million head of sheep are annually taken to Colorado, Nebraska, Kansas, Missouri, and Illinois to be fattened for market. Fort Collins, Colo., receives large numbers of them, and the high price the feeders obtain for their New Mexican sheep demonstrates their superiority as mutton producers.

The sheep make splendid feeders, as they will eagerly and greedily feed upon alfalfa, oats, corn, wheat screenings, etc., and take on weight very rapidly. Their faculty for adapting themselves to existing conditions makes them very desirable animals for the feeders, as they are as much at home in the feed pens as they are upon the ranges. Sheep are also being fattened around Eddy, N. Mex., upon the sugar-beet pulp, and the sugar factory there is now able to advantageously dispose of what was formerly a waste product. Results from pulp feeding have been very satisfactory, particularly in the case of old ewes. The pulp furnishes them with an abundant supply of rich milk, and they are thus enabled to raise strong, well-developed lambs.

No business offers more profitable returns than does that of sheep-raising and woolgrowing in the Territory of New Mexico at the present time.

The cost of running the sheep for a year is about 30 cents per head, which covers the expense of herding, lambing, shearing, dipping, taxes, etc.

The cost of shearing amounts to 2½ to 4 cents per head, according to the class of sheep shorn.

The flocks are usually run in bands of 3,000 to 5,000. The people of New Mexico are unsurpassed in the management of sheep herds. It is no unusual thing for them to take sheep on shares, agreeing to return double the number of young and healthy ewes at the end of five years, with a considerable amount of wool annually; and often after the five years the party, on repaying, has double or treble the

original number left for himself. The flocks require three men, or two men and a boy, and two or three dogs, and when the same man has three or more flocks another man of experience as overseer. Each flock also has a donkey and camp equipage, which with the rations are carried on the donkey. The sheep are grazed from place to place within the range. The men and dogs constantly remain with the sheep during the whole year.

A few years ago sheep could be bought for 75 cents per head, and even at that price there were few buyers. To-day ewes are selling freely from \$3 to \$4 per head, yearlings (wethers) \$2.50 to \$2.75; two years and up (wethers), \$3 to \$3.25, and six-months-old lambs at from \$2 to \$2.25 per head.

One of the prominent sheepmen of New Mexico, who started in the business about twenty years ago with practically no capital, has just disposed of his business, and finds himself worth over \$100,000, notwithstanding the fact that he, in common with the other sheepmen, lost money for several years during the agitation for and life of the obnoxious Wilson bill.

The following statement will briefly show about what can be done in the sheep and wool industry in the Territory of New Mexico:

This is the way it works:

4,000 ewes, at \$3 per head	\$12,000	
Expenses for one year, say 50 cents per head	2,000	
Total cost		\$14,000
At the end of one year you have:		
3,800 ewes (5 per cent loss allowed), at \$3	\$11,400	
21,000 pounds of wool, at 12 cents	2,520	
3,100 lambs, at \$2	6,200	
		20,120
Profit		6,120

Fifty per cent on the original outlay is a handsome return from any enterprise, and we believe we do not err when we reiterate that the people engaged in sheep husbandry in New Mexico are following the most profitable business in the West to-day; and as long as a protective tariff guards their interests the prospects and outlook for the future are certainly very bright for the sheep men, and the prosperity of the Territory is in a very large measure commensurate with the success enjoyed by those who are devoting their capital, brains, and energies to this important industry.

WOOL.

The wool clip of the Territory will amount to fully 15,000,000 pounds for this year. A few years ago the average weight per fleece was very low, but now, owing to improved breeding, it will amount to a little over 5 pounds per head. The wool grown in New Mexico is of a diversified character, scaling from the finest Delaine-Merino to the coarsest carpet. The improvement in the grade of the wool has been coincident with the improvement in the sheep, and the growers are still exerting themselves in the laudable ambition of bringing their flocks and wool up to a still higher standard of quality. Many years are consumed in breeding the coarse-wooled stock up to the desired Merino plane, and so to-day, while clips are shorn that will compare favorably with any in the United States, the majority of them are not uniform in grade, but will contain fleeces producing sorts running from fine to carpet. The lambs of each succeeding year produce a finer grade of

wool, and in time, if the growers continue to use fine Merino rams, the wool clip of New Mexico will be composed of fleeces uniform in grade and of choice character.

There is an ever-increasing scarcity of fine wool in the world, due to the crossing of the fine-wooled flocks with the large-framed, coarse, long-wooled breeds. The tendency to breed exclusively for a large carcass has amounted almost to a craze all over the globe, from which the New Mexican growers have been comparatively free. They have again displayed their intelligence by directing their efforts solely to the production of fine-wooled mutton sheep, and the certain advance of fine wools to a high point will amply reward them for their foresight and labors.

The following tables, furnished by one of the large wool-scouring plants situated at Las Vegas, indicate the diversity in the wool clips grown in the Territory:

A clip of 40,000 pounds of grease wool yielded:	Per cent.
Scoured fine wool	65
Scoured fine medium	35
A clip of 90,000 grease pounds yielded:	
Scoured fine and fine medium	97
Quarter-blood	2
Blanket	1
A clip of 77,000 grease pounds yielded:	
Scoured fine and fine medium	90
Quarter-blood	9
Blanket	1
A clip of 31,000 grease pounds yielded:	
Scoured fine medium	2
Three-eighths	59
Quarter-blood	17
Blanket	18
Carpet	4
A clip of 20,000 grease pounds yielded:	
Scoured three-eighths	43
Quarter-blood	31
Blanket	16
Carpet	10

There are many clips that will show a much greater percentage of the low sorts (blanket and carpet) than is indicated in the tables quoted above.

The advance in the price of wool has kept step with that of the sheep. In 1896, when sheep were only worth 75 cents per head, the price of wool touched its lowest point. Eastern commission houses even refused to make any advance on grease wool, and owners were offered 3 to 5 cents per pound for the fine clips. To-day these wools are worth 11½ to 14 cents per pound, and the importing price of wool has not yet been reached by 2 to 3 cents per pound. Light shrinking wools sold as high as 17½ cents last fall; all of which tends to prove that a protective tariff on wool is neither a myth nor a fallacy, but is essential and beneficial to the wool industry of New Mexico, as elsewhere in the United States.

The production of such a vast quantity of wool has brought within our borders another important industry, the business of scouring wool, as well as of sorting it and otherwise preparing it for the manufacturers' use. Three large plants have been erected at Las Vegas. There is also one located at Albuquerque. There is in addition to these a scouring plant at Trinidad, Colo., across the New Mexican line, which handles large quantities of wool grown in northern and northeastern New Mexico. The town of Eddy is at present contemplating the erection of a wool-scouring mill, and if the water proves suitable for this business they hope to have it running by next wool season.

These scouring mills have been the prominent factor in securing for the growers full prices for their clips. The benefits they confer upon the sheep men are numerous. Their presence and anxiety to secure wool has developed a competition among buyers that has reacted to the growers' benefit. The scouring of wool at home results in a big saving in freight charges, as all the grease and sand carried by the wool is eliminated, and transportation charges are only paid on clean wool. They are a school for the growers, as they teach them the shrinkage of the wool and the percentage of the various sorts taken from it; and, as all wool is bought and sold on a scoured basis, it is very necessary that they should possess this information, as it enables them to dispose of their product intelligently and to good advantage. If wool is consigned to an Eastern commission house to be sold the charges are less for handling scoured wool than for grease wool, the growers have more money to spend at home, and their support of the scouring mills keeps employed in New Mexico much capital and many hands.

The benefits of scouring mills to a community are fully illustrated in the case of Las Vegas, which is to-day the best wool market in the Southwest, and wool is shipped to that point from the most distant parts of the Territory, the growers being attracted there by its excellent outlet for wool.

If the grower sells his wool to an Eastern buyer in the grease he has to pay the freight as well as the charge for scouring the wool, as he well knows, and if he can save the money paid for hauling the grease and dirt in his wool it is certainly to his interest to do so. It is also better for the Territory to have this work done here, as it encourages an important industry and adds to the wealth of New Mexico.

That the conversion of the wool just as it comes from the sheep's back into the condition required by the manufacturers has been remunerative to the growers is demonstrated by the following letters, which were received, with others of similar import, by one of the leading scouring mills at Las Vegas:

PUERTO DE LUNA, N. MEX., *January 17, 1898.*

In reply to your letter of the 10th instant, I have to say that I want you to scour my wool, as you have done for many years.

I have learned by experience that the reputation of your company in the wool market of the East is such that wool sorted and scoured by it sells for the highest market price; and in regard to my wool, when you scour it, and I see the market quotations for scoured wools, I know exactly what it is worth, and I believe the owners of fine wool can realize more by scouring than selling in the grease. For instance, two years ago, when you scoured it, I realized, after all expenses had been paid, \$1,668.48 over the highest price I was offered for it in the grease.

I often hear it asserted that in New Mexico and Arizona we can not raise such wool as is produced in Montana and Northern States, and it may be true; but, nevertheless, I have received for every clip you have scoured the past six years the same price, and I think I owe something to your company for the thorough manner it was sorted, scoured, and put up, and I am going to stay with you.

Yours truly,

J. G. CLANCEY.

P. S.—I hope to have over 100,000 pounds this coming clip.

CHILLI, N. MEX., *January 17, 1898.*

We are very well satisfied with the manner in which you handled our clip last year and the price you got for us. It is our intention to place this spring's clip, which will be in the neighborhood of 200,000 pounds, in your hands again, as we believe all fine wools should be handled through a scouring mill, as there is a big saving in freight and in the commission charged for selling the wool. We are convinced that we can get more money from our clip in this manner than if it is handled or disposed of in any other way.

Yours truly,

McINTOSH & MCGILLIVRAY.

The sheep business of New Mexico has also resulted in the establishment of another enterprise at home, viz, that of wool pulling and tanning. There are located at Las Vegas two wool pulling plants, one of which is also engaged in the tanning of leather. The processes through which a sheep pelt goes from the time it is taken off the carcass until it is converted into leather are many and interesting. When the pelts are received by the puller they are soaked in tanks filled with clear soft water. When the skin is thoroughly softened the water is drained off, usually in hydro-extractors. If what is known as the sweating process is used, the pelts are then suspended from tenter hooks in closed rooms, called the sweat houses. Steam is introduced, and the chemical action produced by the heat upon the skin causes the wool to be easily removed from the skin after having been sweated for about forty-eight hours. The use of depilatories is largely supplanting the sweating method. In this case the flesh side of the pelt is painted with a solution of the depilatory. The pelt is folded and laid away for five to twelve hours, according to the season of the year and strength of solution, after which the wool can be pulled from the skin with great ease, the depilatory having destroyed or eaten the roots of the wool fibers. As the pullers remove the wool they sort it into the different classes belonging to pulled wool, which are technically known as extra, fine super, A super, B super, and C super.

The pelt from which the wool has been taken is now termed the "slat," and it is then put through the processes of liming, beaming, bating, or drenching. At this stage, if the puller is also a tanner, the slat goes to the tanning department, whence it finally emerges as leather. There are about twenty different processes for tanning slats, the four principal ones being the chrome, the oil, the bark, and the alum. If the puller does not desire to tan the slats he proceeds to pickle them, in which state they can be kept for a long period, or they may be sold to those who tan the slats only and do not engage in the preliminary work of pulling. The work of pickling is performed in order to preserve the slats in good condition for tanning, when they are not tanned immediately after the bating process.

The location of these plants within the Territory supplies the growers with a splendid home market, just as the wool-scouring mills furnish him with an unsurpassed outlet for his wool clip.

New Mexican pelts have an enviable reputation for their leather-making qualities. Eastern tanners prefer them to all others on account of their fineness of grain and toughness, and they are largely used in the production of imitation morocco and other fine leathers, as well as for glove stock, for which they are eminently suited. If the butchers and herders will exercise proper care in removing the pelt from the carcass and in curing it afterwards they can obtain fancy prices for them. Pullers and tanners have complained at times that excellent skins have been ruined for leather purposes by reason of careless skinning and handling in the primal stages, an objection that should and can be easily remedied by the exercise of intelligence and care on the part of those who skin the animals and prepare the pelts for shipment to the pullers.

SHEEP SANITARY BOARD.

LAS VEGAS, N. MEX., *July 25, 1898.*

DEAR SIR: I beg leave to submit to you my report, as secretary of the sheep sanitary board of New Mexico, of the business transacted by said board during the year ending June 30, 1898.

The board organized on the 3d day of June, A. D. 1897, by electing Hon. Solomon Luna president, J. M. Gonzales vice-president, and Antonio Lucero secretary.

This being the first year of the existence of the sheep sanitary board of New Mexico, much of its time at the early part of its organization was consumed in adopting rules and regulations for its government, and appointing sheep inspectors, as provided by law, and doing other work necessary and prerequisite to put into execution the business of the new law.

The first work by the board was the preparation and distribution by its secretary of a pamphlet containing a copy of the new law and a circular letter addressed to the sheep owners of New Mexico, calling their attention to the new law, and soliciting their co-operation for its enforcement, copies of which I herewith inclose you.

After the publication and distribution of this pamphlet, the board drafted and adopted a set of rules and regulations, copies of which are also herewith inclosed.

At that same meeting at which the rules and regulations were adopted, the board appointed sheep inspectors for all the counties of the Territory, as provided by law, and gave them instructions to proceed under the law and the rules and regulations of the board.

When the board organized, it found itself without a penny in the treasury, and with very inadequate means to raise funds to defray the expenses which necessarily would have to be incurred to carry out the provisions of the law, so that the first problem to solve was how to raise money for that purpose.

The law provides $1\frac{1}{2}$ mills to be levied on each head of sheep and goats in the Territory, and an additional tax of 5 cents per head on sheep brought in from without the Territory, as an inspection fee, which, when collected, is to be used to defray the expenses of the board.

After mature consideration, the board came to the conclusion that the money thus raised would be inadequate to meet all expenses necessarily incurred in carrying out the provisions of the law; therefore a tax of 1 cent per head, as an inspection fee, to be charged on all sheep inspected to be shipped out of the Territory was agreed upon.

I have kept a record of all sheep brought into the Territory, as well as of all sheep leaving the Territory, which record shows the following result:

Sheep brought into the Territory from other States and Territories from June 3, 1897 to June 30, 1898	95, 548
Sheep going out of the Territory, and inspected by the inspectors at the stock yards during same period	560, 984
Revenue collected from sheep brought into the Territory	\$4, 266. 00
Money collected from inspection of sheep leaving Territory	5, 608. 84
Total collected	9, 875. 84
Of this amount we have expended in paying inspectors, salaries, mileage, and attendance of members of board, and other miscellaneous expenses ..	5, 356. 92
Balance on hand	4, 518. 92

As we were not certain when we started that we would have enough money in the treasury to defray all the expenses of the board, the inspectors were given orders to inspect only such sheep as were reported to them as being scabby, or as they might have personal knowledge were infected, and for that reason my books do not show a complete record of all sheep now ranging within our Territory. However, basing my opinion on the number of sheep returned for taxation in the Territory for 1897, which was 1,800,000, and on the number of sheep which were inspected by our inspectors, which was 1,200,000 according to the reports which I have on hand, I estimate the total number of sheep in our Territory to be about 4,500,000.

I find from my records that of the owners of sheep in the Territory of New Mexico, 85 per cent are Mexicans, and, aside from 50 owners of this number, such as the Pereas, Lunas, Oteros, and other large owners, that the rest own on an average of about 800 head apiece.

This year, having some money in the treasury to defray expenses, and being better prepared in other respects to do the work, we expect to have the inspectors visit each and every flock in their respective counties, so as to have by the end of the year a complete list of all the sheep men in New Mexico, and the number of sheep owned by each individual. Besides this we hope to have by that time almost eradicated the disease called the "scab," which heretofore has been such a drawback to the industry in New Mexico.

During the short time we have been in existence, while we have not been able to entirely cure the scab, still we have accomplished one good result, which is to make the people realize the importance of such a law on our statute books, and I am glad to say that in this work we have had the co-operation of most all the sheep men of the Territory.

I find that in the past all the sheep men of New Mexico have been in the habit of

dipping their flocks every year; but the reason why the scab has not been stamped out is because a very small percentage have used dips properly. For that reason the board prescribed the mode of using the different "dips," adopting rules to that effect, and issued orders to the inspectors to supervise as far as practicable the dipping of such flocks as were badly infected with disease.

I find that the law regulating the sheep sanitary board is very defective as it now exists, but care not to make any suggestions at the present time, as I intend to address myself on that point to you later on, in time for you to embody it in your message to the next legislature.

Very respectfully,

Hon. M. A. OTERO,
Governor of New Mexico, Santa Fe, N. Mex.

Members of the sheep sanitary board of New Mexico are as follows:

Solomon Luna, president, Los Lunas, N. Mex.; Jose M. Gonzales, vice-president, Baca, N. Mex.; W. S. Prager, Roswell, N. Mex.; Antonio Lucero, secretary of board, Las Vegas, N. Mex.

CATTLE.

Hon. M. A. OTERO,
Governor, Santa Fe, N. Mex.

DEAR SIR: I have the honor herewith to transmit the report of the cattle sanitary board of New Mexico for 1897, and incidentally to call attention to the importance of this industry to the material interests of New Mexico. Since 1890, and up to 1897, the prices for their product have been so discouraging that more than half of those engaged in that pursuit have gone voluntarily or have been forced out of the business, and their holdings have disappeared from the range; but notwithstanding all this no other interest in this Territory can to-day show anything to compare with it in its material results.

Before the passage of the law of 1891, requiring the inspection and release of all cattle taken out of the Territory, no records had been kept showing the numbers or the classes of the cattle sent out, and it is not accurately known how many of our native-grown cattle were marketed; but from the records kept and now on file in this office since the above-mentioned law went into effect there must have been, on a conservative estimate, not less than from 2,750,000 to 3,000,000 head sold and delivered during the boom days of the 80's, and that at the prices prevailing during that period must have produced for their owners not less than \$35,000,000.

During the years from and including 1891 and 1896, the records show that 1,340,960 were disposed of—77,353 head of them being slaughtered within the Territory—which, estimated at \$10 per head, a very low figure, for they largely consisted of grown steers, footed up to nearly \$13,500,000. During 1897, 244,495 were marketed outside and 11,419 were slaughtered within the Territory which, at current values, show a return of not less than \$6,250,000.

The following table will show the movement of cattle in each year since the law providing for inspection went into effect:

Year.	Shipped and driven.	Slaughtered.
1891.....	189, 203	14, 612
1892.....	225, 019	14, 739
1893.....	191, 064	10, 503
1894.....	196, 295	14, 284
1895.....	210, 295	11, 820
1896.....	241, 726	11, 400
1897.....	244, 495	11, 419
Total	1, 508, 097	88, 777

With the exception of a scarcity of surface water in a few localities the range is in fine condition and cattle are wintering well. The season is now so far advanced that no destructive storms are likely to occur before spring opens.

One very serious danger, however, now threatens the live-stock interests of the Territory. During the hard times lately experienced owners of both cattle and sheep have relaxed their efforts to destroy wolves, and they have increased to such an extent that their ravages are a serious loss to stockmen, and consequently to the material interests of the range in our Territory. There is an urgent necessity that some measures be taken looking to concert of action by all the counties for their

destruction. Such efforts as have heretofore been made have only resulted in driving them from one locality to another, without affording much relief to any, and it is only fair that the two greatest interests and sources of revenue to the Territory should have adequate protection.

Since the laws of 1893 and 1895, authorizing the cattle sanitary board to take possession of and sell unclaimed and unlawfully handled cattle, went into effect, 1,656 head of such have been sold, the proceeds amounting in the aggregate to \$24,500.44; and in every case where their ownership could be established by the records in this office the money collected by the board has been sent to their owners. Those of the brands that are not of record or were otherwise unknown have been placed on the stray list and will be paid for on identification.

The scarcity of cattle throughout the Union is just beginning to be felt, and as there is also a shortage of sheep it is inevitable that much higher prices for both must prevail for some years to come. There is good reason to believe that well graded cows will sell for \$35 per head before this year is ended, and that they will reach \$50 per head in the near future.

The board present their financial statement to December 31, 1897, together with the names and addresses of the inspectors now employed.

All of which is respectfully submitted.

W. H. JACK, *President.*
J. A. LA RUE, *Secretary.*

LAS VEGAS, N. MEX., *June 20, 1898.*

CATTLE SANITARY BOARD OF NEW MEXICO.

Financial statement December 31, 1897

LIABILITIES.

Cash balance on hand January 1, 1897	\$2,860.69
Cash received for inspections	8,404.53
Cash received for strays	5,512.65
Cash received for tax as per treasurer's statement	1,924.93

18,702.80

EXPENDITURES.

Paid for—	
Inspections	\$8,800.98
Strays	4,207.67
Expense of members	792.85
Secretary	1,000.00
Attorney's fees	500.00
Advertising, stationery, and postage	503.21
General and office expenses	393.60
Cash balance on hand December 31, 1897	2,504.49

18,702.80

I am happy to be able to report that the outlook for the stock-growing interests of New Mexico was never so encouraging as at present. Abundant and timely rains have put the ranges in the finest possible condition, and the demand for all their products by far outruns the supply at much better prices than have for a long time if ever before been realized.

The shortage of both cattle and sheep throughout the Union is now well understood, and that the prices now prevailing, and even much higher ones in the near future, will be continued for a long time to come must be evident to all who give the matter the slightest consideration. For intending investors in this industry no other section of the range country can offer anything like the inducements here to be found.

The nutritious grama grass, indigenous to this altitude, here reaches its fullest development, the nature of the soil, containing as one of its elements a large percentage of gypsum, being especially favorable and in fact the cause of its luxuriant growth. Its habit of seeding late in the season and curing up into hay on the ground furnishes an abundant supply of feed all through the winters (which are mild and open) until the grass comes again in the spring, nature thus furnishing without cost that food supply which must be provided with much labor and at great expense

to carry stock through the winter in more rigorous climes. So well nourished are both cattle and sheep on this feed alone that fat beef and mutton of unexceptionable flavor can be found on the range during any month of the year; it is only in a late and backward spring that the feeding of old and weak "coming-in cows and ewes" is required, but progressive stock men generally make provision in such cases with profit to themselves.

An immense plateau, known as the "Llano Estacado," or "Staked Plains," perennially clothed with the most luxuriant growth of the before-mentioned grass, having a mild and equable climate, has heretofore, on account of the absence of surface water, been considered unavailable for stock-raising purposes. But the experience of the last few years has shown that an abundant supply of the best and purest water at no great depth underlies the whole region; that both flocks and herds, away from the insect pests that at some seasons are troublesome in the valleys and along the streams, find perfect health, thrive wonderfully, and that their increase is almost phenomenal. This section is now practically unoccupied, but the possibilities for successful stock raising there are almost unlimited. It is also a fact that both cattle and sheep raised on these plains have a special flavor of their own, imparted by the herbage on which they feed, and which still pertains to their product when finished for market on grain in the corn-growing section of the Mississippi region, as will be shown by an incident related to the writer by an English gentleman, himself largely interested in cattle for a number of years here in the West. During his recent visit to his home, at a dinner with a large party of his countrymen, a joint of beef on the table, of exceptionally fine quality, came under discussion as to its origin, it being stoutly maintained by nearly all the guests that the joint in question was of English growth; that, in fact, beef of that quality and flavor could be produced nowhere else. He, being in the minority, but believing that he recognized a flavor to which he had become accustomed on the ranges here, took the pains to trace that particular cut to its origin, and found, through the London butcher who sold the meat, that it was American beef, and, upon further investigation through him to the consignee who had had the animal slaughtered at Deptford and had sent the carcass forward to the London butcher, that it came from a high-grade steer of a very well-known New Mexican brand that had been fattened in Kansas and shipped from Kansas City to Liverpool direct.

That this special flavor so highly prized by that discriminating nation of beef eaters should be retained after being fattened and shipped across the Atlantic shows that what has always been maintained for the grama grass, as to its value, is true, not only in producing the carcass, but also for the flavor of the product when finished by intense feeding on grain, and must inevitably before long become a factor in the selection of cattle to be finished by feeders for the foreign market.

In addition to this nutritious forage which in New Mexico nature provides, the use of alfalfa for carrying steers through the winter and preparing them to be quickly finished on grain for the markets is being extensively prosecuted with very satisfactory results. About 7,000 head were so handled in the Mora Valley during the last winter, very nearly all of them going into the hands of Kansas feeders in the early spring at strong prices. It is claimed that with the start given them with the alfalfa they can be finished for market in about six weeks of high feeding on grain, thus making a great saving not alone in the amount of grain used but in the interest charges on capital invested; and that this means a great deal to the cattle interests of the whole of New Mexico goes without saying.

As the alfalfa crop returns on irrigated land a yield of from 3½ to 6 tons during the season, and in addition furnishes during the fall and spring a much-valued pasture that cattle can be driven to and fed on the same ground on which it is grown, saving the loss in handling and the cost of transportation, the value of the manure returning to the soil, making a market for all that can be produced; that both successful farming and stock raising along this line to an unthought-of extent is easily possible, opens another line of profit to both. Alfalfa feeding has also been carried on to a considerable extent in the Pecos Valley from Roswell to Eddy, at which latter place, mixed with the by-products of the beet-sugar factory, it has been fed to both cattle and sheep and, as reported, with success.

The experience of the tyros who during the boom days of the 80's turned loose on the range thousands of cattle, without any knowledge of the business or thought of its capacities for grass, and more particularly water, believing that the mere possession of cattle in their brands was an earnest of fortune to come, and which for these visionary investors ended as it only could, in disaster to themselves, also to their neighbors—anything of this sort, it is safe to say in the light of that experience, will not be repeated.

It has been known to some, but only a few have realized, that since the event just spoken of the numbers of cattle throughout the entire Union were greatly diminished. It is only a few years ago, and particularly within the knowledge of the

writer, that New Mexican wethers were practically unsalable, but the shortened supply and the advanced price of beef led to the feeding of sheep as a meat supply, which, owing to the superior feeding qualities of New Mexico sheep and the extraordinary quality of the mutton so produced, originating from the same cause as that claimed for New Mexico cattle, that is, the herbage on which they feed, has already created a demand by far exceeding the supply, and for which within a short time prices before unheard of were paid; so that New Mexico, instead of having as heretofore an indifferent market for her wool, has now one greater than can be supplied for her mutton, and that the production of both cattle and sheep on her practically free pastures can be twenty times increased without overloading the range is also a fact; for, as before stated, water, the chief factor to be looked after in these industries, can be found in sufficient quantities in a vast unoccupied region where its existence was not believed in or even suspected. The work of the land court, too, in adjusting the title to enormous tracts of fine pasture lands that have heretofore been closed to the public by grant claimants will soon be utilized and stocked with—what is, without doubt, New Mexico's chiefest reliance and most valuable production—cattle and sheep.

Not only are the maturing grounds of Montana, Idaho, and the Dakotas ready customers for our young steer cattle, but the corn-growing States on our eastern border furnish a market with an ever-increasing demand for all range products to be feeding concentrate their farm crops so that they may be marketed at remunerative prices. Though the cattle holdings have been greatly reduced during the recent period of depression, the hard times having been very severely felt by cattlemen, the increase of the last few years has gone a long way to repair the deficiencies in numbers, and through the intelligent interest taken by those who have gone through the struggle to improve the grade, their product is much more desirable and sought for than ever. The number of cattle on the ranges is again increasing, the calf crops for the last three years having been very good and nearly all saved. The increased demand and the stimulation of better prices have encouraged their owners to take better care of them, and the business now seems to be looked after with something like the old-time zeal. During the current year many thousands of cattle from neighboring States and Territories and the Republic of Mexico have been brought into this Territory to secure its advantages of pasturage and climate and freedom from insect pests and contagious or infectious diseases, none of which exist in this altitude.

From data accessible to this office, there were in New Mexico in 1897 about 800,000 head of neat cattle. Those brought in, together with the calf crop of this year, will increase the holdings to over 1,000,000, all of which, being in the hands of experienced cattlemen, will soon show the influence of fine pasture and improvements in grade.

During the year ending June 30, 1898, there were marketed in round numbers 200,000 native New Mexico cattle, producing at current values about \$6,000,000. Since April the movement of cattle to market has been very much retarded in consequence of the war and the conservatism of the banks, who declined to furnish expected and, in many cases, promised funds to enable them to be handled, as well as in a large measure the firm belief of their owners in the increasing value of their property. From January 1 to June 30, this year, this amounted to 60,000 head less than the number that were handled during the same period of 1897, but from the signs of the times now visible all fit cattle will be disposed of before the close of 1898.

I submit a few extracts from the reports of inspectors in different parts of the Territory, giving the views of practical cow men there on the ground.

From San Juan County: "Calf crop about 90 per cent; grade very much improved; owners are taking extra good care of their stock, which have about doubled in numbers during the last two years."

Mora, Colfax, and Union counties: "Calf crop good; cattle in fine condition, and feed everywhere."

Socorro, Sierra, Donna Ana, and Grant counties: "Abundant rains and feed, all that could be asked for. Calf crop for 1898 at least 70 per cent, and grade very much improved."

San Miguel, Gandaloupe, and Taos counties: "Everything as good as has ever been known as to the range conditions, calf crop, and the growth of young stock."

Lincoln and Eddy counties: "Range was never better; everything fat, calf crop immense."

Chaves County: "Cattle and range in fine shape; calf crop above the average and well graded, and practically no loss; market acute and strong; greatest demands for good grades, but all classes sell at strong prices. About 150,000 head in my district."

Now that peace has come again and the corn crop assured, stockmen in this Terri-

tory have reason to feel that prosperity is near at hand; that the strain under which they have labored for so long is passing away, and their experience has taught them that under all circumstances well-cared for and well-graded stock can always find a profitable market.

Respectfully, to,

Hon. MIGUEL A. OTERO,
Governor, Santa Fe, N. Mex.

J. A. LA RUE,
Secretary Cattle Sanitary Board.

List of inspectors employed by the cattle sanitary board January 1, 1898.

O. N. Meyers, Kansas City, Mo. C. F. Hartman, Denver, Colo. C. E. Railston, Engle; T. A. Gray, Clayton; D. O. Bell, Endee; R. L. Moss, Roswell; C. L. Ballard, Roswell; D. R. Harkey, Eddy; J. F. Hinkle, Lower Penasco; J. E. Cree, Fort Stanton; W. C. McDonald, White Oaks; W. N. Fleck, El Paso; W. C. Roy, Mora; T. D. Burns, Parkview; G. E. Lyon, Raton; W. C. Pearce, La Belle; M. Littrell, Springer; C. Lewis, Watrous; P. D. McElroy, Las Vegas; R. Lewis, Albuquerque; J. Phillips, Deming; J. Robson, Lordsburg; S. Locke, Magdalena; H. B. White, Hillsboro; A. Lobb, El Paso; C. Le Bawn, Grafton; G. Doyle, Catskill, N. Mex.

AUGUST 25, 1898.

SIR: I have the honor to submit herewith the report of the New Mexico section of the climate and crop service of the Weather Bureau, United States Department of Agriculture, for the fiscal year ending June 30, 1898.

Very respectfully,

R. M. HARDINGE,
Section Director.

Hon. M. A. OTERO,
Governor of New Mexico, Santa Fe, N. Mex.

REPORT OF THE NEW MEXICO SECTION OF THE CLIMATE AND CROP SERVICE OF
THE WEATHER BUREAU, UNITED STATES DEPARTMENT OF AGRICULTURE.

The section was organized in 1895, under the auspices of the United States Weather Bureau, the Territorial legislature appropriating \$700, or so much thereof as may be necessary, for the printing of climatological data and for incidental expenses. Each succeeding assembly has appropriated annually a like amount. The equipment of stations, stationery supplies, and all other expenses incident to the collection, collation, and dissemination of the data, excepting printing, are borne by the United States Weather Bureau.

The number of stations fully equipped with meteorological instruments is forty-five, but of this number only about thirty-five were making regular reports at the close of the year, including two military posts and reports from two station agents of the Southern Pacific Railway. Each county in the Territory, excepting Taos, has at least one fully reporting station, the station in that county at present being in abeyance.

The publications consist of a weekly bulletin during the crop season, a monthly report, and an annual summary. The weekly climate and crop bulletin is a brief digest of reports received from crop correspondents in different sections of the Territory, with remarks pertinent to the effects of the weather on current crop conditions. About 400 copies of the bulletins are issued every Tuesday, and the subject-matter is widely copied by the press of the Territory. A rough estimate places the circulation by this means at 15,000. The monthly report is a neat quarto pamphlet, containing in detail the meteorological records of the several stations arranged in convenient tables, maps showing graphically the temperature gradients and distribution of rainfall over the Territory, a brief résumé of the crop conditions for the month, and remarks and clippings relative to the work of the section. About 500 copies are printed and distributed. The annual report is also a printed quarto pamphlet, containing tabulated summaries of the data from the several stations

for the past year and charts showing annual temperature gradients and precipitation distribution.

The section center also has supervision over the dissemination throughout the Territory of the official weather forecasts. The official in charge of the section center at Santa Fe receives the forecast by telegraph daily from Washington, which in turn is telegraphed to a number of addresses in the Territory, where further distribution to neighboring communities is effected through the local mails.

The observers and correspondents reporting to the section center receive no remuneration for their services, and the public spirit manifested by them in so faithfully discharging their voluntary duties is deserving of the highest appreciation.

Monthly and annual mean precipitation for the year 1897, with departures from the normal.

Stations.	January.		February.		March.		April.		May.		June.		July.	
	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.
Albert.....	0.45	+0.23	0.65	+0.28	0.55	-0.12	0.32	-0.18	3.00	+0.86	4.27	+2.20	1.56	-2.10
Albuquerque.....	0.57	-0.21	0.13	-0.11	0.72	+0.54	0.63	+0.36	2.07	+1.78	0.99	+0.10	0.31	-0.87
Alma.....	2.33	.....	0.47	.....	0.57	.....	0.15	.....	0.11	.....	0.72	.....	3.04	.....
Angus V V Ranch.....	2.30	.....	T	.....	0.50	.....	0.55	.....	1.70	.....	1.81	.....	5.15	.....
Aztec.....	1.21	.....	1.30	.....	0.94	.....	0.23	.....	1.56	.....	T	.....	0.78	.....
Bernalillo.....	0.28	.....	T	.....	0.68	.....	0.55	.....	2.23	.....	0.63	.....	0.69	.....
Bluewater.....	0.10	.....	1.10	.....	0.40	.....	0.50	.....	1.80	.....	0.12	.....	0.75	.....
Buckmans.....	1.88	.....	1.02	.....	2.29	.....	1.35	.....	4.66	.....	1.11	.....	3.30	.....
Chama.....	2.58	+0.19	4.90	+1.22	5.53	+3.76	0.79	-0.41	.....	.....	.....	.....	.....	.....
Clayton.....	0.38	.....	1.10	.....	0	.....	1.05	.....	4.45	.....	3.29	.....	1.26	.....
Deming.....	1.55	+1.12	0	-0.42	0.42	+0.02	0	-0.08	0	-0.28	0.50	+0.35	2.89	+0.97
Eddy.....	0.41	-0.01	0	-0.54	0.33	+0.25	0.43	+0.29	1.52	+0.58	0.66	-0.90	0.50	-1.28
Engle.....	0.40	.....	0	.....	1.01	.....	1.56	.....	1.20	.....	1.58	.....	3.79	.....
Espanola.....	0.32	.....	0.14	.....	0.94	.....	0.16	.....	3.48	.....	0.08	.....	0.92	.....
Estalina Springs.....	1.14	+0.43	0.35	-0.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fort Bayard.....	1.10	-0.39	0.20	-0.80	1.05	+0.54	0.10	-0.15	T	-0.33	0.60	-0.03	3.38	+0.17
Fort Union.....	0.20	-0.33	0.05	-0.38	0.82	-0.28	0.70	-0.08	9.73	+8.25	3.39	+1.27	2.36	-1.65
Fort Wingate.....	0.41	-0.65	4.20	+2.66	1.60	+0.64	0.11	-0.70	0.70	+0.16	0.25	-0.31	0.91	-1.51
Gallisteo.....	1.45	.....	0.14	.....	0.66	.....	0	.....	4.80	.....	3.61	.....	1.08	.....
Gallinas Spring.....	1.07	+0.56	0.91	+0.40	1.53	+0.97	0.02	-1.01	5.46	+3.91	0.79	-1.35	3.05	+0.43
Gila.....	2.11	.....	0.26	.....	0.87	.....	T	.....	0.07	.....	0.15	.....	1.73	.....
Gold Hill.....	.....	.....	4.00	.....	3.20	.....	2.20	.....	4.39	.....	.....	.....	.....	.....
Hillsboro.....	0.92	+0.15	0.02	-0.84	0.50	+0.20	0.20	-0.10	0.35	-0.21	0.42	+0.02	3.44	+1.11
La Belle.....	1.15	.....	2.50	.....	3.80	.....	0.86	.....	5.05	.....	1.57	.....	.....	.....
Las Cruces.....	0.35	-0.02	0	-0.49	0.46	+0.20	0.23	+0.11	1.54	+0.92	0.07	-0.26	2.25	+0.19
Las Vegas.....	0.69	-0.14	0.70	-0.61	1.43	+0.72	0.37	-0.41	6.63	+4.69	1.23	-0.09	1.18	-3.56
Lordsburg.....	1.21	+0.62	0.20	-0.20	0.12	-0.31	0	-0.09	0.05	-0.31	0.12	-0.16	3.95	+2.39
Los Lunas.....	1.45	-0.85	0.25	-0.22	0.15	-0.54	0.50	-0.03	1.30	-0.02	0.25	-0.25	0.80	-0.20
Lower Penasco.....	1.40	.....	T	.....	.....	.....	0.50	.....	0.85	.....	0.55	.....	5.60	.....
Monero.....	1.37	+0.07	2.25	+0.01	2.31	+0.85	0.84	+0.16	2.55	+1.24	0.32	-0.15	2.86	+0.45
Ocate.....	0.65	.....	0.70	.....	0.80	.....	0.61	.....	9.25	.....	5.51	.....	2.29	.....
Olio.....	.....	.....	.....	T	-0.26	T	-0.09	1.59	+0.97	0	-0.15	0.39	-0.17	.....
Puerto de Luna.....	1.70	+1.00	0.20	-1.11	0.80	+0.25	0.35	+0.19	2.05	+0.65	2.02	+0.50	1.62	-0.73
Raton.....	0.20	.....	0.51	.....	0.40	.....	0.20	.....	4.08	.....	2.12	.....	0.10	.....
Rincon.....	1.23	.....	0	.....	0	.....	0.18	.....	0.88	.....	0.20	.....	1.95	.....
Roswell.....	1.12	+0.68	0	-0.38	0.59	+0.43	1.35	+0.89	3.76	+2.21	1.42	+0.16	2.78	+0.45
San Marcial.....	0.58	.....	T	.....	0.34	.....	0.37	.....	1.63	.....	0.85	.....	1.18	.....
Santa Fe.....	1.11	+0.51	1.10	+0.27	2.06	+1.42	0.87	+0.15	4.35	+3.29	0.57	-0.37	2.85	-0.07
Shattuck's.....	1.28	.....	0.20	.....	0.23	.....	0.81	.....	1.26	.....	2.45	.....	1.95	.....
Socorro.....	0.51	-0.17	0.05	-0.19	0.58	+1.28	1.00	+0.82	1.20	+0.83	0.57	+0.23	2.03	+0.26
Springer.....	0.50	+0.32	0.37	+0.20	0.65	+0.24	0.10	-0.66	5.26	+3.82	4.94	+4.11	2.71	-0.57
Valley Ranch.....	0.50	.....	0.80	.....	1.10	.....	T	.....	4.68	.....	.....	.....	1.12	.....
White Oaks.....	2.32	.....	0.55	.....	1.21	.....	0.45	.....	1.27	.....	1.84	.....	1.78	.....
Winsor's.....	1.35	.....	0.38	.....	2.24	.....	1.37	.....	4.43	.....	1.77	.....	1.98	.....

Monthly and annual mean precipitation for the year 1897, with departures from the normal—Continued.

Stations.	August.		September.		October.		November.		December.		Annual.	
	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.	Precipitation.	Departure.
Albert.....	2.81	+0.75	0.42	-1.89	1.79	+0.75	0	-0.28	0.09	-0.92	15.91	- 0.06
Albuquerque.....	1.31	-0.18	1.22	+0.47	1.44	+0.59	T	-0.37	0.35	-0.07	9.74	+ 2.65
Alma.....	2.16	.....	4.15	.....	1.95	.....	T	.....	.....	.....	.....	.....
Angus V V Ranch.....	3.55	.....	2.72	.....	1.70	.....	0.78	.....	0.30	.....	26.07	.....
Aslee.....	0.45	.....	2.79	.....	1.53	.....	0.05	.....	0.32	.....	11.20	.....
Bernalillo.....	0.47	.....	4.02	.....	1.77	.....	0.10	.....	0.07	.....	11.49	.....
Bluewater.....	0.98	.....	3.00	.....	3.20	.....	T	.....	0.50	.....	12.40	.....
Buckmans.....	3.54	.....	3.09	.....	3.51	.....	0.03	.....	1.36	.....	27.13	.....
Chama.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Clayton.....	1.79	.....	0.85	.....	1.67	.....	0	.....	1.15	.....	16.42	.....
Deming.....	.....	.....	1.87	+0.26	1.57	+0.65	0	-0.72	T	.....	.....	.....
Eddy.....	5.04	+1.94	0.76	-1.08	0.20	-0.60	T	-0.19	T	-0.36	9.85	- 1.95
Engle.....	3.38	.....	2.23	.....	0.74	.....	0	.....	0	.....	16.99	.....
Espanola.....	1.01	.....	2.20	.....	0.87	.....	.....	.....	0.30	.....	.....	.....
Estalima Springs.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fort Bayard.....	5.31	+2.67	4.11	+2.30	1.90	+0.85	0	-0.63	0.25	-0.56	17.00	+ 3.63
Fort Union.....	4.33	+0.14	1.16	-0.83	6.43	+5.53	0	-0.63	T	-0.53	29.17	+11.05
Fort Wingate.....	1.03	-1.22	3.11	+1.83	3.67	+2.58	0.40	-0.34	2.55	+1.55	18.94	+ 4.50
Gallateo.....	.....	.....	1.07	.....	1.50	.....	0	.....	0.90	.....	.....	.....
Gallinas Spring.....	1.09	-1.43	1.01	-0.93	1.51	+0.22	0	-0.54	0.50	-0.33	16.96	+ 1.25
Gila.....	2.42	.....	5.26	.....	1.38	.....	T	.....	0.19	.....	14.44	.....
Gold Hill.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hillsboro.....	3.22	+1.36	6.38	+3.12	2.57	+1.51	0.01	-0.64	0.10	-0.23	17.18	+ 5.65
La Belle.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Las Cruces.....	1.16	-0.71	2.14	+1.23	0.73	-0.18	T	-0.40	0.03	-0.54	8.96	+ 0.08
Las Vegas.....	3.29	-0.34	0.79	-1.55	1.94	+0.78	0	-0.89	0.59	-0.17	17.84	+ 2.36
Lordsburg.....	1.25	+0.52	.....	.....	.....	.....	0	-0.46	.....	.....	.....	.....
Los Lunas.....	.....	.....	0.55	-0.69	0.80	-0.25	T	-0.20	0.15	-0.18	.....	.....
Lower Penasco.....	3.15	.....	1.80	.....	1.05	.....	0.10	.....	0.25	.....	.....	.....
Monero.....	2.04	+0.17	3.66	+1.94	1.99	+0.76	.....	.....	0.70	-1.12	.....	.....
Ocate.....	T	-0.22	2.15	+1.32	.....	.....	.....	.....	0	-0.39	.....	.....
Olfo.....	.....	.....	0.63	-1.10	0.80	-0.56	0.10	-0.15	.....	.....	.....	.....
Puerto de Luna.....	3.09	-1.13	0.11	.....	3.57	.....	0	.....	0.10	.....	11.75	.....
Raton.....	0.36	.....	4.23	.....	0.46	.....	0	.....	T	.....	11.74	.....
Rincon.....	2.61	.....	1.25	+0.15	0.44	-2.10	T	-0.80	T	-0.32	15.65	+ 2.53
Roswell.....	2.94	+0.25	2.92	.....	1.88	.....	.....	.....	.....	.....	.....	.....
San Marcial.....	0.38	.....	2.49	+1.01	1.95	+0.95	0.08	-0.70	0.64	-0.20	20.40	+ 6.15
Santa Fe.....	2.33	-0.28	4.66	.....	0.68	.....	.....	.....	.....	.....	.....	.....
Shattuck's.....	3.77	.....	2.47	+1.26	1.18	-0.56	0	-0.44	0	-0.76	10.61	+ 2.28
Socorro.....	1.02	-0.24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Springer.....	1.73	-0.27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Valley Ranch.....	3.99	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
White Oaks.....	2.28	.....	2.85	.....	0.99	.....	0.06	.....	0.78	.....	16.38	.....
Windsor's.....	3.57	.....	3.77	.....	3.39	.....	0.20	.....	1.04	.....	25.59	.....

THERMAL SPRINGS OF NEW MEXICO.

Excepting the famous Yellowstone National Park, situated in the northwest corner of Wyoming, there is no other locality outside the Territory of New Mexico that contains so many natural thermal springs. This fact is not generally known throughout the States, and I avail myself of the opportunity to say a few words about these health shrines of nature's own furnishing, so frequently sought by the unfortunate sufferer from disease. Many persons not informed upon the natural resources of their own country annually flock abroad to seek relief from the waters of the various European "spas." Many of these persons might be induced to visit the great natural springs so numerous in this Territory could the matter of their medicinal merit be brought to notice in such a way as to show them that what they seek abroad can readily be found at home, and that in curative properties the natural mineral springs of New Mexico excel many of those of European repute.

Accurate analyses made by competent chemists show the composition of most of the springs found in New Mexico to be superior in many respects to those enjoying the highest reputation in Europe and in other countries. Many of these places are far removed from the general line of travel, but those best known to-day are easily accessible to the tourist and health seeker, and are reached by good roads and stage lines. Many of them are equipped with modern hotels and bathrooms, good food, good service, healthful surroundings; in fact, ideal conditions to carry out a line of treatment where regularity, isolation, physical and mental rest are important factors. It would be a work of supererogation to attempt an enumeration of the many afflicted persons who have visited these springs, taking a course of the waters, and returning to their homes greatly benefited in health. A glance at the chemical composition of many of these waters will show that they compare favorably with many of those most sought in various parts of the world.

The geologic processes are so recent in New Mexico that nearly every county in the Territory has its healing, hot, or mineral springs. The purpose of this article is only to give a few facts concerning the more accessible resorts. Many important places are necessarily omitted, because the average tourist would be unable to visit them.

In geographical order the first to be mentioned are—

FOLSOM HOT SPRINGS.

Situated near Alps, a station on the Denver, Fort Worth and Texas Railroad, 59 miles south of Trinidad, on the summit of the Raton range of mountains, close to the extinct volcano of Capulin, in Colfax County, near the northern boundary of the Territory. The altitude is about 6,500 feet, and the location is very beneficial for consumptives. They have fine medicinal properties and promise to become of prominence.

LAS VEGAS HOT SPRINGS.

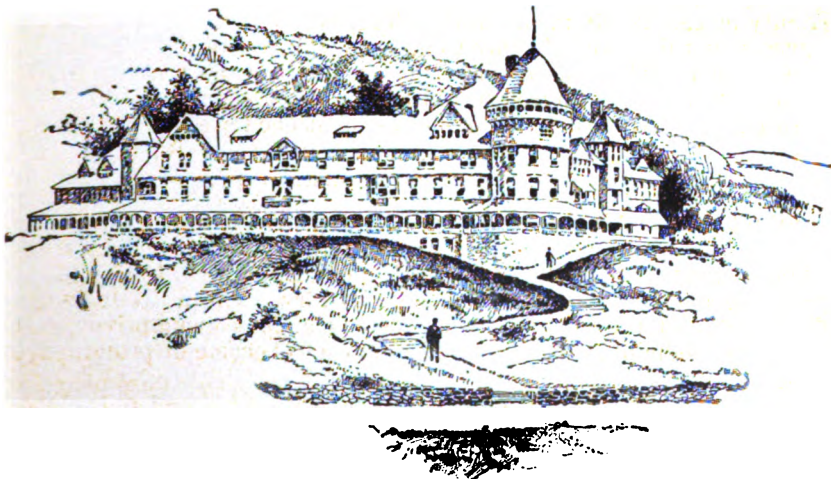
In San Miguel County, at the mouth of the picturesque Gallinos Canyon, on the banks of the Gallinos River, is situated the Las Vegas Hot Springs, famed throughout the length and breadth of the land for their curative virtues in a multitude of diseases.

The springs are twenty-two in number, and from analyses made by Prof. F. V. Hayden, of the United States Geographical Survey, the following is extracted:

Constituents.

	1.	2.	3.
Sodium carbonate.....per cent..	1.72	1.1	5
Magnesium carbonate.....do....	1.08	10.6	10.43
Sodium sulphate.....do.....	14.12	15.43	16.21
Sodium chloride.....do.....	27.26	24.37	27.34
Potassium.....do.....	Trace.	Trace.	Trace.
Lithium.....do.....	St. trace.	St. trace.	St. trace.
Silicic acid.....do.....	1.04	Trace.	2.51
Iodine.....do.....	Trace.	Trace.	Trace.
Bromine.....do.....	Trace.	Trace.	Trace.
Temperature.....degrees F..	130	123	123

In its chemical composition this water resembles in many respects the waters of the famous hot springs of Teplitz, in Austria, while in its two



MONTEZUMA HOTEL, LAS VEGAS HOT SPRINGS.

chief active constituents, the carbonate and sulphate of sodium, it may recall the somewhat analogous, though very much stronger, waters of Carlsbad, justifying in a degree the name often given it of "dilute Carlsbad water." This dilution, however, is more frequently a benefit than a disadvantage, for it permits a larger amount of the water to be taken, thus securing the valuable solvent and eliminating powers of the water itself, together with the remedial virtues of its mineral constituents.

OJO CALIENTE (HOT SPRINGS).

These celebrated hot springs are located in the midst of the ancient Cliff Dwellers, 25 miles west of Taos and 50 miles north of Santa Fe, N. Mex., and about 12 miles from Barranca Station, on the Denver and Rio Grande Railway, from which point a daily line of stages run to the springs. The temperature of these waters is from 90° to 122° F. The gases are carbonic. Altitude, 6,000 feet; climate, very dry and delightful the year round. There is now a commodious hotel for the convenience of invalids and tourists, and the reputation of these wonderful medicinal waters is fast spreading. These waters contain 1,686.34 grains of alkaline salts to the gallon, being the richest alkaline hot springs in the world. An analysis of these waters shows a total of 288.09 parts in 100,000 divided as follows:

Sodium carbonate.....	196.95
Calcium carbonate.....	4.20
Iron carbonate.....	20.12
Sodium chloride.....	40.03
Arsenic.....	10.08
Lithium carbonate.....	1.22
Magnesium carbonate.....	6.10
Potassium sulphate.....	5.29
Silicic acid.....	4.10

JEMES HOT SPRINGS

Are in Bernalillo County, in Santiago Canyon, being a branch of the Jemes Creek, which 9 miles south connects with another branch running through Guadalupe Canyon. To reach them one has to travel from Santa Fe by wagon road to Pena Blanca, 27 miles distant west, crossing the Rio Grande there, and thence keeping a western course through the foothills of the Valles Mountains to Jemes pueblo, 26 miles; from there it is 13 miles to the first group of springs, at Archuleta post-office; or from Bernalillo, on the Atchison, Topeka and Santa Fe Railroad; also by wagon road past Santa Ana and Zia (or Silla) pueblos to San Ysidro and thence to Jemes pueblo, where this road and the former join, distant 27 miles.

Both roads are sandy, but the latter especially so, running for about 13 miles through Jemes Canyon.

A much better road, running from Archuleta north and northeast through the mountains and ending at Espanola, has recently been constructed.

There are several groups of hot springs in Santiago Canyon, but those at Archuleta, and 2 miles farther north, are most frequented. At Archuleta are ample hotel accommodations. Many health seekers prefer the "upper group" and camp there. At both places the scenery is enchanting and the atmosphere dry and healthy.

The lower springs, at Archuleta post-office, have an altitude of 6,620 feet above sea level. Limestone and sandstone of the Carboniferous

age form the sides of the canyon, 1,000 feet high, often changed from their original position by volcanic materials. There are here:

1. A geyser with an opening of 1 square foot, a temperature of 168° F., running about 50 gallons a minute, with escaping carbonic acid and deposits of white carbonate of lime.

2. A spring of 130° F. with free carbonic acid and red-brown deposits.

3. A spring of 119° F. with "alga" (cryptogamic water plants). A black sulphate of iron forms on them, a result of the action of sulphureted hydrogen upon carbonate of iron and oxide of iron in the alga. The sulphureted hydrogen is a product of the reduction of gypsum.

There are more springs, with a temperature from 102° to 108° F. The total salts in 100 parts of water amount to 0.2401 parts of sodium, lime, and magnesia. These springs are especially beneficial to rheumatic diseases.

The upper group, 2 miles from Archuleta, in the same canyon, consists of 42 springs. Their elevation is about 6,740 feet above sea level and their temperature varies from 70° to 105° F.

They flow from caves of carbonate of lime, some of which are 20 feet in height. Combined they form a dam or dike 30 feet high and 200 feet long. The springs contain 37.26 parts solids in 100 parts water, mostly chloride of sodium and sulphate and carbonate of soda, lime, and magnesia. They greatly resemble the famous Marienbad.

Besides the hot springs, north of the upper group are cold mineral springs. Half way between the two groups is an extensive ruined pueblo.

CHERRYVILLE SPRINGS.

In Socorro County, at Cherryville, is the next occurrence of noted springs. These are found near the head of the cañada or falls of the Alamosa, whence Geronimo started out on his famous raid. They are accessible by stage from Engle, a station on the Atchison, Topeka and Santa Fe Railroad. They are on the eastern slope of the Black Range. The temperature is 130° F. and the altitude 6,540 feet.

GILA HOT SPRINGS.

In the southwestern part of Socorro County, on the west of the Gila or Diamond Creek, as it is called, is a group of springs, at 5,545 feet altitude, that are easily reached by wagon from Silver City. The temperature is 130° F. and they carry similar ingredients to the Jemes Springs.

APACHE TAJOE SPRINGS.

Four miles from Whitewater, on the Atchison, Topeka and Santa Fe Railroad, are also found some good springs of 97° F. They are in Grant County, 30 miles north of Deming.

HUDSON SPRINGS.

Twenty-four miles north from Deming, and within 3 miles of Hudson, on the Santa Fe road, are several good springs. These springs are widely known and much frequented, both on account of their medicinal value and the lovely climate and beautiful scenery.

The average temperature of the springs is 130° F. and their altitude 5,782 feet above sea level. The main spring is a mound of soda, lime, and magnesia, in the center of which is a large depression containing the permanently boiling water, which has effected many cures of rheu-

matism and kidney and blood diseases. The water contains in 1 gallon the following solids:

	Grains.
Silica.....	1.552
Alumina and oxide of iron .....	.530
Carbonate of lime	4.448
Carbonate of magnesia	2.624
Sulphate of soda and potassium.....	13.547
Chloride of soda.....	2.286
	<hr/> 24.987

Some other undeveloped springs are about 3 miles north of Hudson Hot Springs.

It remains to be said that close to the western boundary of the Territory are several other locations of hot springs, of which one is about 10 miles southwest of Zuni and one in the valley of the San Francisco River, the latter at an altitude of 5,630 feet above sea level and having an average temperature of 84° F., largely used by the Indians and the people of the vicinity, respectively.

AZTEC SPRINGS.

This is a cold-water spring situated 4 miles east of Santa Fe. From the surrounding hills and ridges a magnificent view is had of the country for many miles, including the city of Santa Fe, the valley of the Rio Santa Fe, and portions of the valley of the Rio Grande del Norte, together with the magnificent mountain ranges in different directions.

Col. D. L. Huntington, surgeon, U. S. A., and curator to the United States Medical Museum, says of this spring: "The water contains 18 grains to the gallon of solid material, and it resembles many of the celebrated German springs, and would be found very useful in such diseases as catarrh of the bladder and all forms of dyspepsia and intestinal indigestion. The water is also useful as a gentle and constant tonic."

Analysis of this water made by F. W. Clark, chief chemist of the Smithsonian Institution, Washington, D. C., shows it to contain the following per 1,000 parts:

Silica.....	0.220
Carbonate of calcium.....	1.538
Magnesium .....	.605
Sodium chloride .....	.225

With enough carbonic-acid gas to retain the carbonates of calcium and magnesium in solution as bicarbonates.

Such healing waters, taken in connection with the pure, dry, and bracing climate of the mountains, should surely prove a boon to those affected with many forms of disease, and the attention of physicians throughout the country is invited to the many merits they possess in the treatment of numerous forms of disease.

HORTICULTURE.

The first annual report of the New Mexico Horticultural Society, covering the year 1897, has just been issued. It contains an account of the fruit exhibit held last year in the city of Santa Fe and the efforts of the society to awaken an interest in horticulture and stimulate, by offering suitable prizes, the production of valuable varieties of fruit.

The exhibit referred to was highly successful. It brought together a display which in many respects was remarkable. It showed that New Mexico, in the variety of its fruit products, having regard to quality as well as species, stands in the foremost rank among fruit-producing parts of the United States. Some States may produce certain species of fruit of superior quality to any yet produced in New Mexico, but the same States may fall short in respect of certain other species in which New Mexico may excel; so that it is in the uniformly high grade of its fruits that New Mexico surpasses the other parts of the Union.

Horticulture is a business to which the people of New Mexico may well give great attention. It would be practicable for them to supply large quantities of excellent fruit to the markets of the Mississippi Valley and the lake region. The climate of their Territory will admit of placing the products of their orchards and vineyards in the market at an earlier date than many competitive places, and care and experience in cultivation would in time enable them to produce varieties of a very superior grade.

Practically all the irrigated valleys of the Territory are adapted to fruit growing. The soil of the Rio Grande and Pecos valleys, for instance, is highly fertile, and irrigation has demonstrated its adaptability to both viticulture and horticulture. A good quality of wine could be produced by care in selecting the proper species of grapes. This has already been shown by what has been achieved in that direction. Altogether, the New Mexico Horticultural Society has an excellent opportunity for the accomplishment of a work of enormous value to the Territory.

Our horticultural fair was pronounced by all the most comprehensive and evenly balanced exhibition of fruits of all kinds ever seen, and it has stamped New Mexico as the most perfect fruit-growing section of the world, and while there are many exhibitions on a much larger scale, and some which might excel in some particular fruit, there is none which includes such a splendid showing of fruits of all kinds. There is one very noticeable thing about the fruit of New Mexico, and that is, it is entirely free from insects of all kinds, is firm, and of very fine flavor.

During the course of this fair it was visited by those familiar with the American Institute fairs in New York, with State fairs of the East, as well as those of Colorado and California, and all concurred that the fruit excelled anything seen before at similar fairs.

Among the exhibits were 246 entries of apples, 34 of crab apples, 125 of pears, 58 of peaches, 108 of plums, 13 of apricots, 37 of nectarines, 15 of quinces, 36 of grapes, 12 of nuts, etc.

When the premium list was published the criticism was made that the numbers of varieties of fruits required for the first premiums were so large that no entries of that character could be made. The schedule called for 40 varieties of apples, 40 of pears, 20 of plums, 5 of apricots, 5 of nectarines, etc. The result showed that our horticulturists are raising a much larger variety of fruits than was generally supposed, as in all the above cases the required number was actually exceeded.

Among the notable specimens were the following: Largest apple, weight, 23 ounces; circumference, 15½ inches. Red Beitigheimer, weight, 18½ ounces. Gravenstein, 14 ounces and 13½ inches. Russet, 13½ ounces and 13½ inches, etc.

Among the pears a Bartlett weighing 18½ ounces and an Idaho weighing 18 ounces were noticed.

The Agricultural College (of New Mexico) exhibit showed a peach weighing $10\frac{1}{2}$ ounces, and a Pride of the Rio Grande weighed $10\frac{1}{2}$ ounces.

A bunch of Muscat grapes, grown as far north as Espanola, weighed 25 ounces, though not ripe; and Stanwick nectarines from the same locality reached $5\frac{1}{2}$ ounces in weight.

No premiums were offered for vegetables and no provision made for their exhibition, but so many excellent specimens were brought in voluntarily that it is evident that arrangements should be made to include them as well as floral displays at subsequent exhibitions.

The horticultural fair which has just closed here was a great success from every point.

MEMBERSHIP AND INCOME OF THE NEW MEXICO HORTICULTURAL SOCIETY, INCORPORATED AS A TERRITORIAL INSTITUTION IN 1886.

The number of life members is 17; of annual members, 166.

As life membership practically cuts off future income, the society has decided to lay aside half of the sum received from life members as a permanent fund for the purchase of land or erection of buildings in the future.

The total receipts of the society during the past year were \$712.40.

Life members.....	\$150.00
Annual members.....	166.00
Admissions.....	169.45
Subscriptions.....	67.50
Donations.....	27.85
Premium, less expense.....	131.60
Total.....	712.40

AGRICULTURE—HORTICULTURE.

[George Vestal, agriculturist and horticulturist, New Mexico Agricultural College Experiment Station.]

AGRICULTURE.

Our agriculture is carried on by the aid of irrigation, and when water is plentiful abundant crops are produced. In San Juan, Rio Grande, Pecos valleys and other parts of the Territory modern farms exist, and when well managed are profitable. When a system of storing flood waters is put in operation immense areas will be put into cultivation. Alfalfa is the principal crop raised, producing three to four cuttings each season, yielding 3 to 5 tons of hay. It is an excellent feed, and most work horses receive no other at any time of the year and remain in good condition even when continually worked. Wheat is largely raised, principally by the Mexicans. As it yields more than any other grain crop, it is used for feeding purposes quite largely. Rye and barley also do well. The experiments carried on with sugar beets at this station and by farmers in the different parts of the Territory during the past year conclusively prove that beets of the highest quality can be produced in nearly every section of the Territory. Beets were produced which showed 10 to 22 per cent sucrose, great numbers of the samples running 14 to 17 per cent. The cultivation of the sugar beet is susceptible of a great development. Kaffir corn has proved to be a good crop in this climate and is largely cultivated in some sections. There are many crops not now cultivated which would prove profitable if attention were directed to them. Many sections of New Mexico, by reason of altitude or other conditions, have climates peculiarly their own, which would prove well adapted to some particular crop which would suggest itself to any live farmer. One great advantage the farmer has here over the Eastern farmer is the ease by which he can preserve his crops. The dry pure air retards decay to a great extent, and the absence of heavy dews and rains enables him to harvest and store his crops with but little waste.

HORTICULTURE.

It is in horticulture that New Mexico may expect her greatest development. The soil, when properly cultivated and irrigated, and the climate seem to be peculiarly adapted to the production of fine fruit. The soil is supplied with such essential

elements for tree growth as lime, potash, etc., in such abundance as to be practically inexhaustible. These fertilizers form a large part of the expense bill of the fruit grower of the humid region. Our sunny climate produces a large, fine-flavored, high-colored, attractive-looking fruit, which greatly adds to its selling qualities.

The fruit industry of the Territory is still undeveloped. True, fruit growing has been largely carried on in San Juan County, the Rio Grande and Pecos valleys, and large quantities of fruit have been shipped to near-by and distant markets, successfully competing with fruit from other States; but the large area comprising the small valleys, mesas, and level tracts, when supplied with irrigating waters, will produce such fruits as their climates will mature in larger quantities and to a greater perfection than any other part of the United States.

VEGETABLES.

Vegetables of all kinds reach their highest development in the parts of the Territory having climates favorable to their growth, and when properly cultivated yield enormously. The quality of our fruits and vegetables will compare favorably with those produced anywhere. The celery of Bernalillo and Chaves counties has gained a wide reputation for its crispness and fine flavor and is quite largely shipped to adjoining States. The cabbage of northern New Mexico has been known for years to be as fine as can be produced. In all parts of the Territory onions of the largest size and finest quality are produced. The tomatoes of the Mesilla Valley when canned are superior to any yet brought to this market, and the demand for them is rapidly increasing.

TEN ACRES ENOUGH.

[W. S. Burke.]

WHAT A MAN CAN DO WITH A SMALL TRACT OF LAND, UNDER IRRIGATION.

Sweet potatoes of most excellent quality yield abundantly in all the valleys of the central and southern portions of the Territory, and constitute one of the best crops that the farmer can raise, because they enable him to realize a good return for his season's work from a very small tract of land, which is an important consideration to a farmer anywhere, but especially so to one in an irrigation country. The soil and climate of this country seem to be peculiarly adapted to the growth of the sweet potato; the quality of the product is fully equal to that of the famous potatoes of New Jersey, and a fair average crop will give from 900 to 1,000 bushels to the acre with proper cultivation. They never sell for less in the fall than \$1 a bushel, and those that are kept into the winter usually bring as much as \$2. From this it will be seen that 1 acre cultivated to sweet potatoes in New Mexico will yield the farmer as much money as he can hope to realize in a good year from 80 acres of corn or wheat in Kansas or Nebraska, and since the results are to be measured by dollars and not by acres, it will be apparent to anyone that the irrigation farmer, although he may not be able to cultivate fields as broad as those of his neighbor in the rain belt, has a better prospect of success and a decidedly better chance of a bank account at the end of the year.

The onion is another product that seems to be peculiarly adapted to this section of the country. The large white Spanish onions, which grow to greater perfection in the Southwest than anywhere else in the United States, afford one of the most profitable crops that can be grown in this Territory, and requires irrigation to bring it to perfection. On account of its beautiful silvery color and its peculiar mild flavor, this onion finds ready sale in any part of the country and always brings the highest market price. The yield is about 500 bushels to the acre under proper cultivation, and the price at home ranges from \$1 to \$2.50 per bushel.

Celery and asparagus are also articles which are especially adapted to the soil and climate of this country and attain here a degree of excellence rarely found in such articles grown elsewhere.

The New Mexico celery is far superior to that grown in California, and is pronounced by all who try it fully equal in all respects to the famous Kalamazoo product, which is noted throughout the country for its superiority.

And when it comes to asparagus, New Mexico can fairly claim to "beat the world," for nowhere else on the American continent is there raised asparagus which can at all compare with that grown in the valleys of central and southern New Mexico. In many places there are large quantities of saltpeter in the soil (the American settlers call it "alkali" because it comes to the surface after a rain and makes the ground white, causing it to resemble the alkali plains of the North). This article, which is deleterious to many kinds of vegetables, is the favorite food of asparagus, and obviates the necessity of applying salt to the ground, as has been done wherever this vegetable is grown in the Eastern or Middle States. It also causes the plant to attain a degree of excellence and flavor in this country which is unknown elsewhere. Dur-

ing April and May, the months when the cutting is done, the shoots will attain, under favorable conditions, a growth of about 6 inches in a day, every particle of which is edible; there is no woody portion to be thrown away; the whole stock is as soft and tender as green peas, and the flavor is proportionately superior. Sample lots of New Mexico asparagus have been sent to many parts of the country, and the verdict is everywhere the same: "The best I ever saw." It is not only better than that grown in the East, but is so much better that its superiority is noticeable at once, even to the casual observer. Actual experience has shown that it will bear shipping to Portland, Me., and that is as far away from New Mexico as you can get in the United States, so the whole country is open to us as a market, and that the article can be sold wherever it is introduced goes without saying; it will sell itself.

An asparagus bed of 1 acre will yield after the third year about 200 pounds a day for sixty days—which is as long as it is wise to cut it; this will bring an average of 10 cents a pound during the season. An acre in sweet potatoes will yield 900 bushels, worth \$1 a bushel at least, as soon as they are dug. An acre of onions will yield 500 bushels, worth never less than \$500, and an acre of celery can be relied upon to bring at least \$600. A man needs 2 acres in alfalfa and 2 in corn or oats for his horse and cow, and 2 acres for house lot, orchard, and kitchen garden. That makes 10 acres in all, which is as much as any man needs to farm for profit, and is fully as much as the most industrious man can cultivate properly. There is an abundance of good land for such purposes to be had in all parts of the Territory. Take for example the Rio Grande Valley, the oldest portion of the Territory in point of settlement—a section that has been settled for more than three hundred years—and yet not one-fourth of the available land in this section of the country is under cultivation at the present time. Beginning a little above Bernalillo and going down to a point a little below San Marcial, we have one of the most desirable and fruitful sections of this famous valley, and lying right in what may properly be called the agricultural center of New Mexico, a district of about 150 miles in length, and with an average width of about 5 miles, embracing 750 sections, or 480,000 acres; and yet a careful writer, who has traveled frequently over the district of country in question says: "If we concede that one-tenth of the land is now under cultivation we are making a very liberal estimate." But if we should almost double this very liberal estimate, we should still have in the district referred to about 400,000 acres of unused land—enough to furnish homes and profitable employment to 40,000 families, or more than the entire present population of the Territory. And there is no waste land in this district named—it is all arable and all tillable, and needs only the application of water to make it as productive as the best land in any part of the world. The Rio Grande carries water enough for the cultivation of the whole of this tract without encroaching in the least upon the rights of those who live farther down the river. True, there would not be water enough under the system of irrigation at present in use—a system that was adopted three hundred years ago, when economy in the use of water was something wholly unknown and totally unnecessary, and under which the water wasted is at least five times as much in quantity as the water used—but it is not to be supposed that this system will continue many years longer. Modern systems of irrigation are being introduced in all other sections of the country where farming is done by irrigation. New Mexico will not remain long behind the times. The system practiced in California and Colorado, and in the Pecos Valley in our own Territory, which puts the water upon the cultivated fields and not upon the waste places and the wagon roads, will soon be adopted in this section, and then, as we have said, the Rio Grande will furnish water enough to irrigate all the lands in its valley, and will support more people than are now in the whole Territory.

In a country like New Mexico, where all kinds of fruit and vegetables can be grown to such perfection and in such profusion, is the place for canning factories, and it is safe to say that there is hardly a settlement in the Territory in which there is not at the present time a good opening for an establishment of this kind. The genial climate, the long seasons, the almost perpetual sunshine, and the rich soil, which is further enriched at every irrigation by the valuable sediment which is brought down from the mountains, all combine to produce conditions which are not surpassed in any part of the world for the successful growing of garden vegetables, and the yield of these is so enormous that it would hardly be believed by anyone who does not possess a practical knowledge of the subject. There is a reliable home demand for all such products, and everything of that sort that can be grown here will be needed to supply the wants of our own people; but there are comparatively only a few vegetables that can be kept for winter use without preserving or canning. It is a well-known fact that the people who live in the cattle and sheep camps and the mining camps and villages of the West are the largest consumers of canned goods in the world; many of them practically live out of tin cans. The area of country in the Southwest that can be used for mining and grazing purposes is so much greater than the area that can be cultivated, and such a great number of

people must always find employment in those occupations, that all the vegetable products of the country will always find a ready market at home. But as is well known, it is necessary for the greater part of these products to be canned in order to be utilized. At present we are not producing one-fourth of the vegetables we consume, for want of proper facilities for preparing them for market, and while we are able to produce more and better vegetables than any other section of the United States, our people are fed mainly upon the inferior products of other sections. If this condition of things had to be permanent it would be rather discouraging; but it will not continue very much longer; the good openings that are presented in all parts of the Territory for the establishment of canning factories will soon be taken advantage of by men who are looking for good business opportunities. The only reason why such industries have not already been established in all sections of the Territory is the fact that our present careless and haphazard system of irrigation renders the supply uncertain; but given a reliable modern system, such as will soon be introduced in every section where there are intelligent, progressive people, and it will be but a little while before we have canning factories enough established in the Territory to take care of all the vegetables we can raise, and the large sums that we now send abroad every year to pay for stuff that we buy from other sections will be kept at home for the benefit of our own people.

With respect to canned goods, woolen goods, and all other articles which can be manufactured successfully here, we will not only have the advantage of a market at home for all we can produce, but the Territory is so far away from any other manufacturing center that the cost of transportation on goods shipped in from abroad is great enough to give the home manufacturer a good "protective tariff," which no Congress can repeal.

NEW MEXICO APPLES.

[From the Scranton, Pa., Tribune.]

THE ORCHARDISTS OF THE EAST MUST LOOK TO THEIR LAURELS.

The best display of fruit seen in Scranton in many a day is a collection of New Mexican apples in the window of Clark, the florist. They fill a large glass case and are veritable "apples of gold." If New Mexico produces such fruit as this she certainly has received the choicest of the goddess Pomona. Some of these beautiful spheres are flaming red, others golden yellow, or crimson, or violet. There are blushing Winesaps, golden Pearsains, transparent white Nonesuch, and gorgeously striped Ben Davis. If such fruit could replace some of the disreputable worm-eaten and effete apples found in our markets at the present time, many a heart would rejoice as the memory of the apples of childhood come floating back, for there are none so delectable as those of "auld lang syne," except it may be these reminders of far-away New Mexico. We hope our agricultural friends may see them. The growers of the West, it is said, are planting largely with an eye to the Eastern market, so a word to the wise may be sufficient. The orchardists in the East must prune and cultivate, or his far-away competitor, with a superior article, will come in and take his home market in fruit, as he has already in cereals.

HOW THEY RANK.

The crop report for November, issued by the United States Department of Agriculture, contains some statistics regarding the apple crop of the country which can not fail to impress the orchardist with the superiority of New Mexico over any other State or Territory in the Union as an apple-producing country.

The great apple State of the extreme east is New York, and New York apples are noted the whole country over for their excellent quality and flavor. But so far as quality goes the palm must be awarded to the apples raised in this Territory. The statistics published in the report mentioned show that the yield of the past year, as compared with a full crop, is only 35 per cent. In New Mexico the yield, as compared with a full crop, for the same season, was 113 per cent. In Illinois the yield was 82 per cent; Missouri, 56 per cent; Michigan, 18 per cent; Colorado, 94 per cent; California, 100 per cent.

New Mexico leads in the production of fruit, both in quantity and quality. The Territory also leads in the per cent of production in pears. There can be said but very little more in regard to New Mexico as a fruit section. The high altitude of the most of the Territory renders dangers from insect pests less than in other sections, while the irrigation system insures a full crop or more every year. In this connection it can also be said that there are thousands of acres of land suitable to fruit raising that only need water placed upon them to make the growing of fruit of all kinds profitable and certain. New Mexico is rapidly coming to the front as a horticultural country, and the day is not far distant when these lands will be valuable.



NEW MEXICO APPLES.

THE CULTIVATION OF THE GRAPE IN THE MESILLA VALLEY.

Among the natives the grape is the principal fruit raised in the valley, although many of the American farmers own good vineyards. The former grow the Mission grape almost exclusively, whereas the latter mostly raise the Muscat of Alexandria, Black Hamburg, Gros Colmar, Malvoisie, and other so-called California varieties, all of which thrive perfectly.

The grapes begin to ripen toward the end of July, and the shipping season usually lasts till about the last week in October. A great deal of wine is made, but it is usually more profitable to sell the fruit for table use. During the season large quantities are shipped, mostly in 10-pound baskets, to all the towns in New Mexico, and to many of the markets of Arizona, Colorado, Texas, Louisiana, etc.

The vineyards are usually started by putting a couple of cuttings during March every 8 feet each way, although many of the older vineyards are set at 6 feet apart. When the cuttings begin to grow, the weaker one is pulled out and the stronger left. The object of setting two cuttings is to make sure of one growing. At 8 feet apart each way 680 vines go to the acre, and this seems a better way or distance, than 6 feet apart, as it gives more room for cultivation. Some of the most progressive horticulturists consider that the rows 10 feet apart and the vines 8 feet apart in the row (544 vines to the acre) is still better.

What is known as the "stump" method of training and pruning is followed. This consists in staking the vine during the first two years, so as to form a straight, upright trunk. The first year the vine is allowed to grow as it will, when it is cut back to its strongest eye. The second year all the buds are rubbed off to the height of 15 or 18 inches, and at the next pruning the cane is cut back to 18 or 20 inches, leaving two or three buds as a basis for the future head. From now the "short spur" system of pruning is adopted; that is, the canes are all allowed to grow as they please during the summer, and at the regular pruning in March these canes are cut back to one or two eyes, from which spring the bearing canes. Of course as the vines get old too many spurs are made, and many of them too long, when some of them must be cut out altogether. Under this system most of the grapes seem to thrive very well, although there is a great deal of careless staking and training in the early life of the vines, resulting in difficult pruning later on, and many of the bunches get spoiled by the mud, owing to the want of good, straight, strong trunks to hold up the fruit.

There is considerable difference of opinion as to whether the grapevines need to be hilled up during the winter in this valley. The old custom among the natives has been to cover the vines with hills of earth in the month of November and not to uncover until the following March, when it is time to prune. The mounds of earth are raised sufficiently high to just cover the buds which are to be left for the coming year. No irrigation is given during the winter, or until after pruning.

The object of this hilling up is not to protect the vines so much from the winter cold as from the cold, drying winds, which cause the trunk to crack and the canes to winterkill. It is, however, claimed by those who have tried it in recent years that if the vineyards be irrigated during the winter these dry, cold winds do no harm and the vines thrive better. Pruning is usually done in March, but earlier grapes are produced when the vines are pruned in the fall.

Undoubtedly much better results would be obtained if the vines were wider apart, better trained, and the surface soil kept well pulverized

throughout the year. People taking up this industry would be well repaid for the care given their vineyards in the sale of their grapes at good prices—soon becoming independent.

VEGETABLES.

Most every kind of vegetable can be raised in this Territory except, perhaps, the Irish potato in some localities. The potato is a native of the mountain country in its wild state, and in the central and western parts of Socorro County, along the northern line of Colfax County, and extending southward for 100 miles along the base of the mountains, the finest potatoes in the world are grown. The raising of this crop requires very little work, and the yield is very large.

Turnips, carrots, ruta-bagas, and cabbage all do well. Of the latter, it is no uncommon thing to see heads weighing from 20 to 30 pounds, and occasionally one that weighs several pounds more. Cabbages are worth from 1 to 5 cents per pound, depending upon the season of the year when they are sold. Onions excel in size and flavor, and are a good paying crop.

FRUITS.

The fruit industry is coming to the front rapidly, and people coming to this Territory to settle learn what fine fruit can be produced here with much less trouble than in the States. There are many magnificent orchards in this Territory. The size and variety of the fruits raised would astonish and delight our Eastern orchardists. A large evaporator is now being built in Santa Fe.

Apples flourish luxuriantly. Pears, quinces, and plums appear to be in their native clime. The strawberry, currant, gooseberry, raspberry, and blackberry all thrive vigorously. The valley along the Rio Grande appears to be particularly adapted to all kinds of fruits, although all sections of New Mexico susceptible of cultivation will produce the finest variety of fruits, and most abundantly.

CEREALS.

Wheat, in quality, size, and quantity, is not excelled anywhere in the United States. Corn does well, and oats grow luxuriantly, but are generally cut green and fed in the straw.

TIMBER.

Both hard and soft pine, spruce, oak, cedar, walnut, mountain ash, quaking asp, box elder, cottonwood, etc., are all found in great abundance.

LUMBER INDUSTRY.

Extensive pine forests in New Mexico make the lumber industry here an important one. All over the Territory individuals are erecting saw-mills, whose product is demanded and utilized by the people who use lumber for building purposes in the place of the ancient adobe. The profits of lumbering are large.

The Government, very wisely, has located several large forest reserves for the protection of the timber in this Territory, and from the care and attention being now given to the different forest reservations by the

authorized agents of the Government much wealth will be derived for New Mexico in the near future. I would recommend that other reserves be located at as early a date as possible.

CANAIGRE.

An industry that is exclusively adapted to the arid southwest, and especially adapted to New Mexico, is the production of the canaigre plant.

The following extract from Bulletin No. 21 of the Arizona Experiment Station will give the information asked by many as to whether canaigre may be grown in their respective localities:

The best conditions for the growth of canaigre are a cool but not freezing climate, a moderate amount of moisture, sandy, fertile soil, and probably, also, a sunny and arid atmosphere. These conditions are nowhere combined more perfectly or for a longer period of the year than during the six or seven cooler months in the arid southwest. A mean temperature of about 70° or less is required for the growth of canaigre. Above this, even though there be abundant rain, as was the case in August, the roots will not do more than sprout feebly, and various attempts to make them grow in warm weather have failed. This seems to limit canaigre to the southwest, for nowhere else, excepting possibly in some southern States, is there so long a period of mild weather. It has been grown experimentally in Florida with some success, but in the Northern States the interval between the severe cold of winter and the extreme heat of summer is too short to allow of much root development. The sprouting of the roots in August, under the influence of rain, suggests that, in the culture of canaigre, one or two summers would prepare the plant to grow more promptly on the advent of cool weather.

The growing plant will stand a good deal of cold. When frosted the leaves lie prostrate on the ground, but immediately regain position when thawed out by the sun. The root also will endure freezing. It has been left in the ground all winter 60 miles north of New York City, subjected to a temperature as low as 15° below zero, without injury. At Lincoln, Nebr.; the roots stood a very severe winter without any damage whatever. At Peoria, Ill., plantings made in 1892 were still alive in 1895, and similar results are noted at Washington, D. C., and Garden City, Kans. The new root development, however, is stated in a number of cases to be insignificant under such conditions.

As to locality, canaigre is found more commonly in sandy washes where water is more abundant. With irrigation it will make a good growth in any fertile, tillable ground, but the influence of soil conditions on actual production has been little studied. It seems to stand considerable alkali, and is even reported in the salt-grass meadows of Tia Juana Valley, near San Diego, Cal.

The tanning materials in canaigre remain pretty constant throughout the growing season, with, however, a small but distinct increase after the plants become established in vigorous growth. The amount of this increase in mature roots from year to year was further shown by taking four samples of wild roots, comprising every age up to about five years, dividing the samples as nearly as possible into successive years' growth, and analyzing. It was found that the average increase of tanning materials from year to year, in ten instances, was 1.64 per cent in water-free material. In one set of cultivated samples the averages of the first and second year's roots differed 2.64 per cent. This indicates a small but constant increase in the per cent of tanning materials from year to year, but holds true only so long as the roots retain their vitality. When they die the tanning substances quickly disappear. Although the percentage does not increase remarkably from year to year, the roots themselves become larger, so that the actual amount of tanning materials is much greater.

THE CULTURE OF GRAPES.

The Rio Grande Valley is well adapted to the cultivation of grapes. The principal kind now existing is the "Mission grape," which was introduced by the "Catholic missionaries" as early as 1711, and has ever since proved to be the standard variety in this Territory, on account of the richness of its flavor, and the amount of sugar it contains. It makes an excellent red or white wine, and is equally valuable for the market. From experiments we know also that our Mission grape compares favorably with the French grapes for the manufacture of champagne.

With skill and good management it can not be surpassed. The cultivation of the vine has been practically taught to the natives, and their methods have proved ever since fully successful as to the covering, uncovering, cleaning, and pruning of vines.

There is no doubt that the soil of this Territory is splendidly adapted to the cultivation of the grape. Of late years a number of new varieties of vines have been introduced by various parties, and are doing well; nevertheless, they require the same methods of cultivation as does the Mission grape.

One acre, or 1,062 vines, will yield each year about 12,744 pounds of grapes, or 910 gallons of wine. This is considered a moderate estimate.

FANCY TOBACCO SEED TO BE DISTRIBUTED AMONG NEW MEXICAN FARMERS BY THE COMMERCIAL CLUB OF ALBUQUERQUE.

The following letters relative to the culture of tobacco have been received by the Commercial Club of Albuquerque, and the seed mentioned is now at the club rooms awaiting distribution. The seed will be issued in small quantities to all farmers who wish to raise tobacco and who will agree to give the intelligent care and attention necessary to insure successful cultivation. The letters are self-explanatory:

CHICAGO, ILL., December 22, 1897.

COMMERCIAL CLUB, *Albuquerque, N. Mex.*

GENTLEMEN: Not long ago Mr. Chambers, general freight agent, sent me a sample of the tobacco raised in the vicinity of Albuquerque, which I sent to an expert grower in Virginia, who reports on same as follows:

"The tobacco you sent to me has an excellent flavor, but owing to the fact that it was cut before being thoroughly ripe, it cured up green. In as dry a climate as New Mexico, with the proper kind of seed to begin with, tobacco ought to cure a splendid bright-red color without using any fire at all. But in order to get the right color and flavor, two things are necessary—the right kind of seed, and allowing the plant to become thoroughly ripe.

"In New Mexico the plant bed should be made in February, and should be from 20 to 50 yards square, according to the size of the crop contemplated, and should be irrigated. The plant bed should be gotten in thorough order and the seed should be sown in it by the 1st of March.

"The plant should be ready to set out in June, and, if the ground is in good order, one rain or one irrigation will make the crop. Tobacco requires less water than any other plant I know of. The great trouble with us is that we have too much rain, which makes it cabbage or bunch up. If we could have moisture just when we wanted it, and not too much, and such soil as you have in the West, we would make the finest tobacco in the world.

"Hoping to hear from you soon, I remain, your friend,

"W. G. PILKINGTON."

Comment is unnecessary. Tobacco is one of the most important and most profitable of crops. On the strength of the opinion above given, by one qualified by long experience as a grower and manufacturer to speak knowingly, I would warmly advocate your body's taking up the matter of careful experimentation in tobacco culture, with a view to its becoming established on a sound basis as one of New Mexico's products. I will be glad to render any assistance in my power to that end. I have written for information as to the best seed to use.

Very respectfully,

JAMES A. DAVIS,
Industrial Commissioner, A. T. & S. F. Ry. Co., Chicago, Ill.

ALFALFA HAY.

The remarkable development in the West of the species of hay known as alfalfa, within the past few years, can not fail to interest the farmer immigrant. Special attention is now given here to the cultivation of that crop, and it has proved a great success. It is a plant of wonderful power of growth. As a rule, three cuttings a season are

made in the North and five in the South, which will average, for the season, one and a half tons per acre to each cutting.

It is a species of lucern, a perennial, an enormously prolific grower, containing a very high percentage of nutritive matter, and is of such a hardy, aggressive character that once it is firmly rooted it requires little attention other than an occasional irrigation and harvesting of the heavy crop of hay which it produces. It is the fodder plant of this region and the one factor that will permit stock raising and fattening to be successfully carried on upon modern scientific principles, in what has heretofore been known as the "arid region."

Formerly, from the want of some cheap fattening food, the far West was entirely dependent upon the agricultural States for its fattened beef. Cattle were shipped from New Mexico to Kansas or Missouri, fed there on corn, and then sent back as beef in refrigerator cars, to be eaten, perhaps, close to the place in New Mexico from where a few months previously, the thin ox had been shipped, thus necessitating a double journey of 600 to 1,000 miles, and an additional expense of 4 to 6 cents per pound for carriage alone. To-day a good percentage of the beef eaten in New Mexico is fattened here on alfalfa, and in the future, as more land is placed under irrigation, the proportion will be largely increased, for the profits are necessarily large, the cost of the double journey of the corn-fed beef being so greatly in favor of the New Mexico farmer.

Another, and perhaps a greater, revolution is being brought about by alfalfa, enabling New Mexico farmers to breed high-grade and thoroughbred bulls. Formerly ranchmen were obliged to go to the Middle States for the large number of high-class bulls they required for the improvement of their herds. The acclimatization of these upon the Western plains was accompanied by enormous loss, chiefly owing to the great difference in climate and pasture. To-day, with the aid of alfalfa, breeding such cattle is fast becoming an important industry in New Mexico. The climate here being the same and the grass similar to that upon the great cattle ranges, the mortality during acclimatization is slight, and cattlemen willingly give a higher price for a New Mexico than for an eastern bred bull.

Another important consideration to the advantage of this grass is that as cattle can largely depend upon the nutritious native grasses during the winter, the New Mexico farmer has three great factors in his favor: First, a higher value for what he raises; second, less cost of production; and third, a practically unlimited market at his door, with no heavy freight charges to pay when shipping to the buyer—a combination of advantages that must soon drive his Eastern competitor out of the market, and leave alone in his hands a large and profitable business.

For all these reasons there will, for a long time to come, be an immense demand for alfalfa for cattle raising purposes.

The same conditions apply to hog raising, and with equal force. It will doubtless sound strangely to the Eastern farmer to be told that hogs are here fattened for the market on alfalfa hay, but it is nevertheless true, and the meat thus produced is fully equal, if not better than corn-fattened pork. It seems to be as good for hogs as for cattle. It is becoming the rule here, and such hogs command high prices, as "hog cholera" is not known in these mesa regions.

Alfalfa is a perennial plant, and when once sown will last for many years. It is difficult to say how long it is profitable to keep the same field in alfalfa, but there are many instances of land that has borne

crops of alfalfa for twenty years, and even for a longer period, without showing any signs of depreciation.

The seed is usually sown in February, on land already seeded to wheat, and oats are also frequently sown with the alfalfa in order to act as a shade to the young plants. But quite as good results have been obtained by sowing the alfalfa alone. The seed may also be put in the ground at the end of September. The young plants will soon appear above the ground and will continue to grow, in roots if not in leaf, during the greater part of the winter.

The cost of seeding an acre of land, from an estimate made in the Mesilla Valley with alfalfa is as follows:

Plowing and harrowing.....	\$5. 00
Drilling seed	1. 25
Making borders for irrigation	2. 50
Twenty-five pounds of seed, at 8 cents	2. 00
Total	10. 75

The annual expense will be:

Cutting, raking, gathering, and stacking $3\frac{1}{2}$ tons, at \$1	\$3. 50
Irrigating six times, at 15 cents .....	. 90
Water per acre .....	. 75
Cleaning lateral ditches .....	. 50
Baling $3\frac{1}{2}$ tons, at \$1.35	4. 72
Hauling to railroad $3\frac{1}{2}$ tons	3. 50
Total	13. 87

This makes the cost of the hay in the stack \$1.60 per ton and not quite \$4 baled and delivered on cars. Hitherto most of the alfalfa has been sold as hay, but much better returns are obtained by feeding it to live stock for raising hogs and dairy produce, which undoubtedly constitute the best products for the farmer. Alfalfa usually gives four cuttings in the year, but with care and plenty of water it would be possible to get five cuttings, yielding altogether 5 or 6 tons of hay. Owing, however, to a somewhat slovenly method of farming and the occasional lack of water, the writer places the average yield in the valley at $3\frac{1}{2}$ tons per acre.

MAKES GOOD PORK.

Wherever alfalfa can be raised, the best as well as the cheapest pork and bacon can be produced, for alfalfa gives growth to the muscle, making the lean meat that is the best and sells the best. And while growing in the alfalfa fields the hogs get the exercise needed for healthy development. Wherever it will grow it may be made a highly profitable crop and one that will get out of the swine industry its biggest possible results.

RANGE GRASSES.

There are about thirteen or fourteen different plants indigenous to New Mexico that, curing on the stalk, without cutting or labor of man, comprise the great bulk of the valuable fattening food for range stock. A short description of each is given below.

The majority of the native, uncultivated forage plants of New Mexico are grasses, and the others, such as sotol and prickly pear, impress one as rather queer stock foods. The grasses of this class belong to two different groups—those which grow in the moist and alkaline soils of the valleys and those which are found on the mesas, and whose only supply of moisture is the little rain that falls during the year. Where

irrigation is possible the best of all forage plants—alfalfa—can be raised in such great abundance that the cultivation of few other hay or fodder crops is attempted.

Hilaria nutica (Galleta grass).—This grass is found principally upon the high planes on both slopes of the Rocky Mountains. It is also known in localities as “black gramma;” is a perennial grass, spreading by means of thick, scaly, underground stems, the roots of which are very nutritious, and stock seem to relish them.

Paspalum distichum (joint grass).—This grass is also known as “knot grass” in some localities. It is adapted to warm, moist soils of alkaline tendency, and in New Mexico is most abundant on low lands that are flooded occasionally, and upon the ditch banks late in the season. It is cut by the natives, to be fed green to stock before corn has matured. This grass is said to have some medicinal qualities.

Eriochloa punctata (Hamil).—Irrigated but uncultivated fields usually produce an abundant crop of the above-named grass each season. After the corn is “laid by,” or during what little rain we have in the summer, this grass appears in the cornfields, along the ditch banks and the fence rows, and makes very rapid growth during the hot days of August and September. It produces an abundance of seed, and will reseed the ground each year. Land once seeded with it would produce a crop of fair hay after a crop of wheat has been taken off, and, so far as judged from an analysis, should be a valuable forage plant.

Panicum crus-galli (barnyard grass).—This rapidly growing annual is widely naturalized over the western and southern parts of the United States. As is indicated by its great geographical range, it has great powers of adaptation to climatic condition and is very variable, two well-marked varieties being recognized. It varies in height from a few inches to 5 feet and over, but the usual height is 3 feet. The natives cut this grass and feed it to their stock while green, before the corn matures. There is a difference of opinion as to the value of this grass as a hay crop. Some think it very valuable, while others think it worthless. It would be excellent to feed with alfalfa, and the two properly mixed would make a first-class combination.

Panicum obtusum (grapevine mesquite).—This is one of the native Southwestern grasses, found generally in the rich, loamy bottoms of the river courses, very rarely appearing on the mesas. It is a perennial which spreads rapidly, grows about a foot high, and produces a rather strict panicle of flowers. Stock seems to relish it. It does not grow tall enough to cut for hay, but would make a very fine pasture grass if supplied with water; its habits of growth and its great vitality would tend to prevent its being tramped out by stock.

Muhlenbergia texana (Texas drop-seed grass).—This is a perennial, growing upon the mesas and the dry rocky hillsides. It is sometimes known as the “grama grass,” and is probably as valuable as any of the true grama grasses; it is also called “mesquite grass.” This plant rarely exceeds a foot in height, but it is a grass that is much relished by stock on the range. Occasionally, when the summer rains have been heavy, it is cut, cured, and baled along with the grama grasses and others, and makes a very valuable hay.

Lycurus phalaroides.—This is a common grass, and is usually found on the rocky ridges and hills of the plains, and not rarely in the mountains. It has been collected at an altitude in New Mexico of over 6,000 feet above sea level. It grows in bunches under the most favorable conditions to a height of 18 inches. It would only be valuable for stock when fed with something containing much protein and fat.

Sporobolus airoides (bunch grass).—This is one of the commonest of all the native grasses in the western United States, and is found in all arid portions of the Rocky Mountain region from Montana to Texas and west to California. It is perennial, forming dense tussocks on flat, dry, alkaline plains. While it is of no value as hay, it is considered a good pasture grass in some sections, and it certainly is of great value upon those alkaline "flats," which will support few other kinds of vegetation, since it flourishes in such localities, and stock relish it.

Dr. Rothrock says that this grass and another closely related species (*S. cryptandrus*) furnish a fiber which might be utilized in making paper or cordage.

Bouteloua oligostachya (blue grama).—This is the common grama, and is also known as "mesquite grass" and is frequently mistaken for the "buffalo grass" (*Buchloe dactyloides*), which with it at one time formed the bulk of the pasture upon the Western plains and ranges. With the increased number of animals upon the ranges these grasses are being somewhat killed out, since they are very rarely allowed to seed, and thus few new plants are produced each season. It is a perennial, growing in small dense clumps. It is not considered a very good grass for hay, but it is frequently cut and cured when standing with other grasses, but as a pasture grass it is probably the best of all native grasses. It is not easily tramped out and requires only a small amount of water. It grows rapidly and cures standing, and stock prefer it to almost any other rough food even when dry.

Bouteloua polystachya (six-weeks grama).—This is a common name applied to two species of the genus *Bouteloua*, which are quite common and similar in character, and the two usually appear together. Both are annuals, and spring up in the open mesas just after the summer rains, and grow very rapidly, maturing in about six weeks. Under the influence of these grasses, plains that were entirely bare will turn green and become valuable pasture land in a very short time. It is considered a very nutritious grass for stock.

Bouteloua eripoda (woolly jointed grama).—This grass is also known as the "black grama," and forms a large portion of the native forage of this district. It is somewhat different from the other perennial gramas in habit, growing more like the six-weeks gramas. It does not grow in bunches or clumps, but is rather diffuse. It gets the name of "woolly jointed grama" from the fact that the internodes or "joints" of the stems are thickly covered with silvery white hairs. Late in the season the stems become dark colored, and from this gets the name of "black grama." The analysis of this grass indicates that it is not so good a food as most of the other grasses, since it is particularly poor in protein.

Bouteloua curtipendula (tall grama).—The tall grama or "bairy mesquite grass" is perhaps the most widely distributed of any of the grama grasses, being reported from nearly all of the States west of the Mississippi River and from several east of it. It is usually found on rocky hillsides and along the bases of the mountains, though it is not uncommon in the valleys and on the higher parts of the mountain ranges, having a vertical range of three or four thousand feet. It cures as other native grasses do, and is considered a valuable feed by stockmen. Stock of all kinds eat it readily. It is frequently cut with other grasses by those who use and sell wild hay in this Territory. It has been recommended by good authority as an addition to the pasture grasses of Tennessee, and is said to be cultivated to some extent in the Southern States and to be much prized.

Eremochloe kingii Watson.—This is a small grass. It seems to be

well fitted to the climatic conditions of high, dry, and hot plains. It produces a crop every season, no matter how little rain falls. Its nutritive ratio of 1 to 11.6 is much better than that of corn stover, and indicates that it may be a moderately good food. The plant is small and tough, and stock seem to eat it only when there is nothing else left. Its main value appears to be in the fact that it is almost sure to produce a crop when other grasses fail.

Distichlis spicata (salt grass).—This is the true salt grass (also known as alkaline grass), and it certainly deserves either name, since it forms a thick sod over these marshy, alkaline "flats" and "draws," which are of comparatively frequent occurrence in this Western country. It grows well where alkali covers the surface of the land with a thick, white crust, provided there be sufficient water to supply its needs. It is cut in some localities, making a poor hay, but in this Territory, as far as is known, it is only used for a pasture grass. Animals eat it readily while it is green, but it should not be fed by itself.

A description of a number of other varieties of forage plants might be given if it were not for lack of space, and I will only mention the names of a few others, such as the Millo maize and Kaffir corn, Italian millet, Pearl millet, alfalfa (on which quite an article appears in this book), mesquite, tornillo, prickly pear, and sotol.

I mention these grasses more fully than I would do, because in many instances the newcomer in New Mexico is impressed by the apparently barren stretches of mesa which surround the valleys. He is told that stock raising is one of the principal industries of our Territory, and he immediately wonders where the food of all these cattle, sheep, and horses is obtained. But the dry, barren mesa produces much valuable forage, and, with the increase in numbers of the stock upon the range, the animals have acquired the habit of eating anything in the way of vegetable matter which is at all digestible or nutritious.

BEET SUGAR IN NEW MEXICO.

The pronounced success in beet-sugar production in the Pecos Valley has occasioned widespread popular interest in the cultivation of sugar beets throughout New Mexico.

During the past three years, from beet seed furnished by the Agricultural Department in Washington, under the direction of the College of Agriculture at Las Cruces, the better class of farmers in the Territory have been raising sugar beets with uniform success. The fact is clearly demonstrated that on all the valley lands in New Mexico, with irrigation, may be grown the finest crops of sugar beets of the most satisfactory quality for the manufacture of sugar.

It appears that beets of large size, of small sugar content, may be grown almost anywhere with the ordinary attention given to a crop of corn or potatoes; but special conditions of soil and climate seem to be necessary to produce a crop of beets rich enough in sugar to be profitable for purposes of manufacture of sugar. In determining the presence or absence of these conditions, our Territory has occasion for congratulation in the zeal and good work of the College of Agriculture at Las Cruces.

Throughout the Rio Grande Valley, from El Paso to the Colorado line, results appear to be uniformly satisfactory. In the central portion of the Territory, in the high valley region about Santa Fe, the conditions of soil and climate appear to be specially suited to this crop. Here the uniform temperature, and almost perpetual sunshine during

the growing season, seems to develop a larger percentage of sugar in the beet than in almost any other section of the United States in which tests have been made. It appears from tests made at the experimental station last year that Santa Fe grown beets weighing over 10 pounds tested over 12 per cent sugar content, and smaller beets of less than 20 ounces contained more than 20 per cent of sugar.

The yield per acre with irrigation appears to be merely a matter of care and skill in cultivation and in handling the crop under our conditions of climate. The tendency in overirrigation is to produce a large beet of small sugar content. On the other hand, on the prevailing sandy clay soil about Santa Fe, from 10 to 12 tons of small beets of large sugar content may be grown with even less water for irrigation than is usually given an average crop of corn. For sugar making the beet most desired should weigh less than 20 ounces and contain more than 15 per cent of sugar; and for the raising of this beet New Mexico has the necessary soil, sunshine, water, and cheap labor to successfully grow in almost any quantity desired. It is not alone in the production of sugar beets of superior quality that New Mexico invites the attention of the sugar-making interest in the country; her railroad facilities for delivering beets at a common point centrally located for the manufacture of sugar in the Territory are all that can be desired. Both at Santa Fe and at Albuquerque may be located sugar factories, convenient to the ample supply of good water, cheap fuel, the best of limestone in unlimited supply for factory use, and reliable local labor. The Rio Grande Valley, and especially in the neighborhood of Santa Fe, has been the home of a native population for many generations accustomed to small truck farming and gardening with irrigation, and are already skilled in the light labor required for the cultivation of the sugar beet.

It is rare indeed that all or so many of the conditions for successful beet sugar production may be found in the same locality.

Nature has indeed been generous in endowing New Mexico in this particular interest.

GYPSUM.

In south Santa Fe County, in the county of San Miguel, and in several other places in New Mexico, are to be found large deposits of this mineral. In Donna Ana County, on the San Augustin Plains, there exists the largest deposit of gypsum known in the world, of an exceedingly pure character. The location of this deposit is unique. The San Augustin Plain is about 150 miles in length from north to south, and from 30 to 60 miles from east to west. Near Whiteoaks, in Lincoln County, in the midst of this plain, is the crater of an ancient volcano, the lava from which has flown in a southerly direction like a stream of water for a distance of 60 or 70 miles, varying in width from one-half to 3 miles. At the southern end of this stream of lava there is a small stream of salt water flowing into a salt lake, about 1 mile in width, and 1½ miles in length. At the southern end of this lake the bed of gypsum begins, and extends in a southerly direction down the center of the plain, adjoining what appears to be an ancient river bed, almost without a break for a distance of 50 miles. The gypsum bed varies from 5 to 20 miles in width. It is granulated in character, white as the driven snow, and seems to be piled up on the plain like snowdrifts, requiring no labor for mining or for handling. I can not more accurately describe its appearance than by comparing it to granulated sugar. If you should take granulated sugar in one hand and the gyp-

sum in the other it would be difficult to tell one from the other by sight or touch. The body of gypsum stands from 10 to 40 feet above the surrounding plain, and the line is as distinctly marked as the sand upon the ocean beach.

CARBONATE AND SULPHATE OF SODA.

Immediately adjoining this extensive deposit of gypsum upon the west, and in what is apparently the bed of an ancient river or lake, exists a deposit of carbonate and sulphate of soda, carrying about 15 per cent of carbonate of soda, 20 per cent of sulphate of soda, 4 per cent of borax, the remainder being mostly moisture and sulphate of lime. This deposit is about 1 mile wide and 5 miles in length. Its depth is unknown. At from 2 to 4 feet below the surface water is encountered, which is largely impregnated with these minerals and with chloride of sodium. Explorations have been made in several places throughout the deposits by driving down tubes to a depth of from 20 to 30 feet without discovering any change in the character of the deposit.

There is also a considerable deposit of carbonate of soda near Manzano, in the county of Valencia, and near Wagon Mound, in the county of Mora.

KAOLIN AND FIRE CLAYS.

These valuable minerals have been found in considerable quantities in several places in the Territory. The most notable deposit of fire clay worked to any considerable extent is situated near Socorro, in Socorro County. There has been a recent discovery of a large deposit of kaolin and fire clays in the suburbs of Santa Fe of superior quality. Efforts are now being made to utilize these clays at the Territorial prison. In the immediate vicinity there is also found a considerable bed of graphite, and it is hoped that in the near future it will be extensively worked.

ALUM.

A large deposit of alum has been opened on the Gila River. It is reported to be of great commercial value, and is now being worked to some extent. With proper railroad facilities these alum beds and the beds of gypsum and soda, heretofore referred to, would become the most productive properties in the Territory.

PRECIOUS STONES.

In describing the mineral resources of New Mexico, the native precious stones are worthy of mention, as they are steadily rising in popular estimation and production.

Traditionally this Territory has been noted as having produced some remarkable gems, and recent developments are proving the older records to have been correct. It is only recently that scientific research and skilled labor have been directed to this purpose. The result is a steady increase of expert prospecting and labor in development, which, though only fairly begun, has resulted in finding many varieties of precious and semiprecious stones.

The estimated production and value of gems up to the year 1890 can be found in the census reports of that year. It is worthy of remark that the amount and the value thereof are understated, the facilities for correct and full information being limited.

Since that time the annual product has more than doubled, and is still increasing. Diligent prospecting has revealed new deposits, and the industry bids fair at present to become a large item in the economic resources of the Territory.

The gems found in New Mexico, in the order of their value, are emeralds, there being one now cut in Santa Fe which weighs 1 karat and is of fine quality. Many other smaller ones have been found, although no expert search has been made for them thus far. A very recent find, next in value, is a gem resembling the ruby in respect of color, brilliancy, and hardness. Of these, quantities are found frequently associated with peridots and garnets, but differing from the latter in being harder and of a different specific gravity and form of crystallization. The range of color is from a light rose or pink to that of a bright red garnet. Though no very large ones have been found, yet gems cut from those found have sold at \$20 to \$50 each, while their numbers and merits have made them a decided acquisition to the list of precious stones of New Mexico, which must, when more widely known, create for them a large demand.

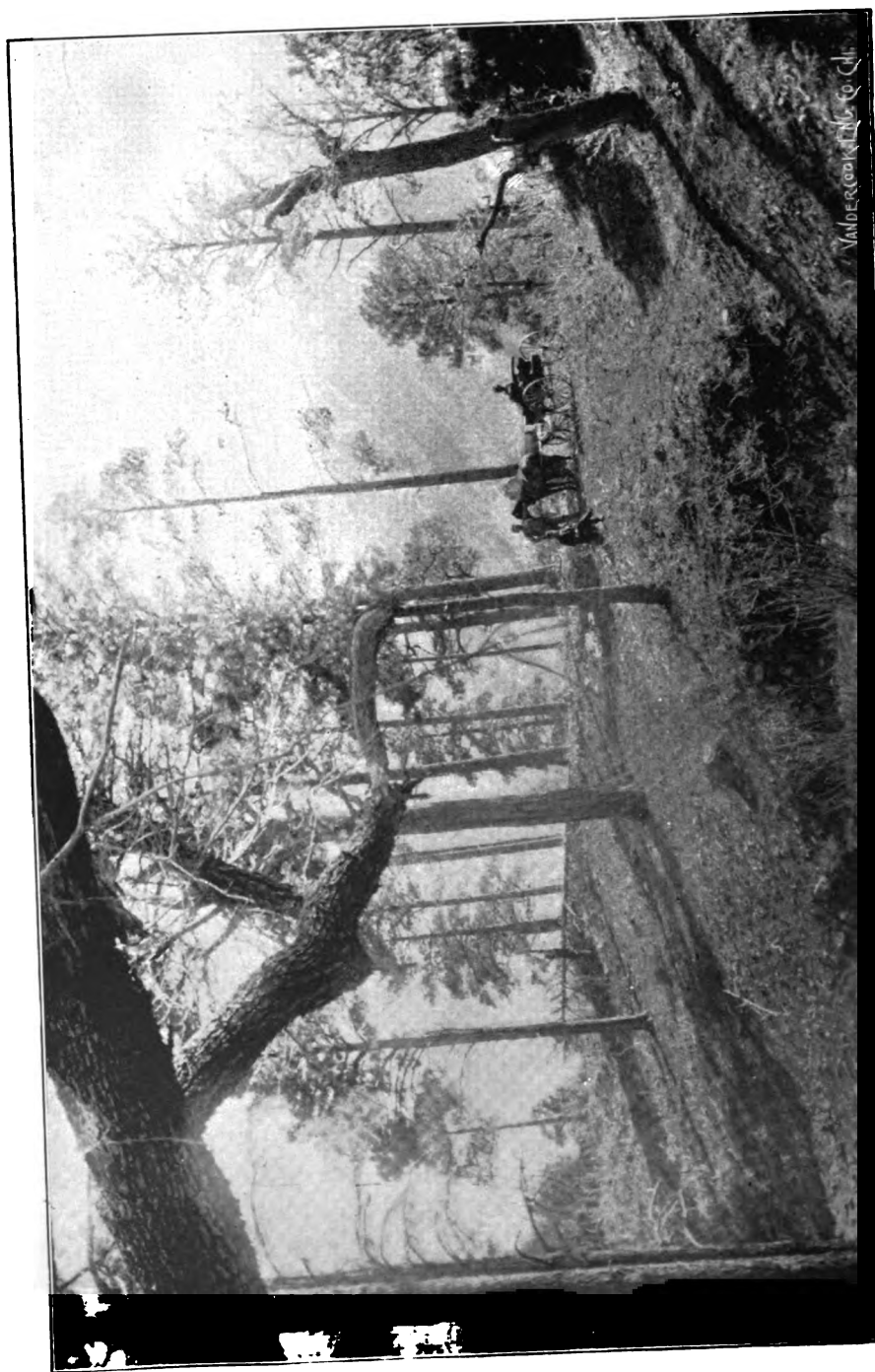
The turquoise deposits of the Territory are too well known to require an extended description. It is only necessary to state that while some of these gems have been famed in Europe for centuries, yet in the United States they have never met the appreciation their merits and rank as gems deserve until the last few years; now they are in great demand, having been pronounced by experts equal, if not superior, to the Persian turquoise. There are single gems from Santa Fe County, now in New York, held as high as \$4,000, and some in Santa Fe of nearly equal size and quality.

This sudden appreciation has given a stimulus to further research, resulting in finding large turquoise deposits near Silver City, in the Hatchitas and Cow Spring mountains, of great merit. One of the new discoveries is phenomenally large, considering quantity of production, size, and color of stones found in it.

In addition to the above-named are found native euclase; the so-called Montana sapphires, garnets, milk and fire opals, peridots, a great variety of fine agates, besides petrified woods, fit for inlaying, mosaic work, or jewelry. Gold and silver quartz valuable for fine work in jewelry are produced from various mines.

COAL.

Chief among them is that of coal, of which there are large beds of bituminous situated in nearly every county in the Territory, and an extensive body of anthracite coal near Cerrillos, in southern Santa Fe County.



Valley of the Gods

FINANCIAL.

Quarterly statement of the Territorial treasurer of New Mexico for the fourth quarter of the forty-seventh fiscal year, beginning November 30, 1896, and ended February 27, 1897.

Title of fund or account.	Balances Nov. 28, 1896.	Receipts during quarter.	Transfers to funds.	Transfers from funds.	Payments during quarter.	Balances Feb. 27, 1897.
Interest fund.....	\$5,847.78	\$116.04	\$2,916.94	.....	\$5,960.58	\$2,920.18
Licenses.....	687.91	2,610.03	.....	.....	2,188.59	1,091.35
Penitentiary current-expense fund ..	3,615.26	.....	1,788.52	.....	2,387.98	3,015.80
Salary fund.....	8,097.81	1,684.00	1,835.56	.....	7,901.67	3,715.70
Court fund.....	157.85	.....	55.16	.....	.....	213.01
Miscellaneous fund.....	7,478.81	.....	2,279.71	.....	5,863.27	3,995.25
Compensation-of-assessors fund	1,748.01	3,309.61	.....	.....	4,138.64	918.98
Transportation of convicts	388.91	.....	266.12	.....	339.74	315.29
Deficit fund, forty-fourth fiscal year ..	38.80	.....	.....	.....	38.80	.....
University of New Mexico	4,221.46	4.30	3,124.52	.....	5,940.00	1,410.28
Agricultural college	397.90	11.18	2,061.42	.....	969.33	1,501.17
New Mexico School of Mines.....	110.64	2.14	2,010.41	.....	1,000.00	1,123.19
New Mexico Insane Asylum.....	837.29	2.14	4,455.36	.....	3,443.99	1,886.80
Territorial normal institutes	29.18	9.71	.....	.....	.....	38.89
Branch agricultural experiment station ..	66.25	18.06	.....	.....	66.25	18.06
Cattle indemnity fund	2,748.40	4,748.23	.....	.....	5,308.27	2,188.36
School fund.....	236.70	.....	.....	.....	101.80	134.90
Interest on deposits	1,226.19	2,555.69	.....	.....	2,011.17	1,770.71
Territorial institutions, forty-fifth fiscal year .....	.....	357.13	.....	\$357.13	.....	.....
Deficit fund, forty-second fiscal year ..	154.60	.....	.....	.....	.....	154.60
Territorial purposes, forty-sixth fiscal year .....	.....	2,039.06	.....	2,039.06	.....	.....
Territorial institutions, forty-sixth fiscal year .....	.....	510.74	.....	510.74	.....	.....
Deficiency fund, forty-sixth fiscal year ..	544.63	.....	289.54	.....	.....	834.17
Special court fund	2,534.99	.....	.....	.....	487.19	2,047.80
Normal school, New Mexico (Silver City) ..	104.16	21.86	1,976.36	.....	1,247.02	855.36
Normal school, New Mexico (Las Vegas) ..	369.86	21.85	1,976.36	.....	961.29	1,426.78
Territorial purposes, forty-seventh fiscal year .....	.....	7,492.49	.....	7,492.49	.....	.....
Territorial institutions, forty-seventh fiscal year .....	.....	2,185.24	.....	2,185.24	.....	.....
New Mexico Military Institute.....	920.46	.....	1,901.49	.....	.....	2,821.05
Territorial purposes, forty-eighth fiscal year ..	546.99	48,755.71	.....	.....	5,851.92	43,450.78
Territorial institutions, forty-eighth fiscal year ..	159.52	14,293.29	.....	14,452.81	.....	.....
Total	43,306.36	90,748.50	27,037.47	27,037.47	56,205.50	77,849.36

RECAPITULATION.

Balances November 28, 1896.....	\$43,306.36
Receipts during quarter	90,748.50
Total to be accounted for	134,054.86
Payments during quarter.....	56,205.50
Balances February 27, 1897.....	77,849.36

DISPOSITION OF FUNDS.

First National Bank of Santa Fe	\$2,929.62
Bank of Commerce, Albuquerque.....	2,160.43
First National Bank of Las Vegas	11,032.16
First National Bank of Albuquerque.....	11,539.47
Taco County Bank.....	5,027.84
New Mexico Savings Bank and Trust Company ..	2,385.37
San Miguel National Bank	11,784.13
First National Bank of Raton	6,979.48
Bank of Roswell.....	6,079.94
National Bank of Commerce of New York	17,413.43
Western National Bank of New York	375.94
Cash items.....	141.55
Total	77,849.36
Funds not available.....	2,385.37
Funds available.....	75,463.99
Deduct interest due.....	17,413.43
Free cash balance.....	58,050.56

Quarterly statement of the Territorial treasurer of New Mexico for the first quarter of the forty-eighth fiscal year, beginning March 1, 1897, and ended May 29, 1897.

Title of fund or account.	Balances Mar. 1, 1897.	Receipts during quarter.	Transfers to funds.	Transfers from funds.	Payments during quarter.	Balances May 29, 1897.
Interest fund	\$2,920.18	\$9.19	\$13,839.82	.....	\$13,930.00	\$2,839.19
Licenses	1,091.25	1,970.14	.....	.....	2,000.00	1,061.49
Penitentiary current-expense fund	3,015.80	74.00	15,697.30	.....	10,485.53	8,301.57
Salary fund	3,715.70	2,220.60	10,945.07	.....	8,362.06	8,519.31
Court fund	213.01	.....	390.02	.....	298.80	304.23
Miscellaneous fund	3,895.25	.....	16,709.88	.....	8,478.76	12,226.37
Compensation-of-assessors fund	918.68	1,147.37	.....	.....	1,589.40	478.65
Transportation of convicts	315.29	.....	1,574.96	.....	1,477.37	412.90
University of New Mexico	1,410.28	.05	959.01	.....	.....	2,369.34
Agricultural college	1,501.17	.47	636.04	.....	1,501.17	636.51
New Mexico School of Mines	1,123.19	.03	634.84	.....	1,575.00	184.06
New Mexico Insane Asylum	1,889.80	30,000.03	1,425.78	.....	8,983.46	29,329.15
Territorial normal institutes	38.89	.45	.....	.....	.....	39.34
Branch agricultural experiment station	18.06	.87	.....	.....	.....	18.93
Cattle indemnity fund	2,188.36	2,289.45	.....	.....	3,308.22	1,169.59
School fund	134.90	1,080.00	.....	.....	829.46	386.44
Interest on deposits	1,770.71	353.75	.....	.....	1,825.40	305.06
Territorial institutions, forty-fifth fiscal year .....	.....	8.47	.....	\$8.47	.....	.....
Deficit fund, forty-second fiscal year	154.60	.....	.....	.....	.....	154.60
Territorial purposes, forty-sixth fiscal year .....	.....	173.89	.....	173.89	.....	.....
Territorial institutions, forty-sixth fiscal year .....	.....	43.40	.....	43.40	.....	.....
Deficiency fund	834.17	.....	24.70	.....	799.37	59.50
Special court fund	2,047.80	.....	.....	.....	.....	2,047.80
Normal school, New Mexico (Silver City)	855.36	1.09	631.94	.....	855.36	633.03
Normal school, New Mexico (Las Vegas)	1,426.78	1.09	631.94	.....	1,426.70	633.11
Territorial purposes, forty-seventh fiscal year .....	.....	2,833.92	.....	2,833.92	.....	.....
Territorial institutions, forty-seventh fiscal year .....	.....	827.90	.....	827.90	.....	.....
New Mexico Military Institute	2,821.95	.....	628.08	.....	2,800.00	650.03
Territorial purposes, forty-eighth fiscal year	43,450.78	15,937.18	.....	56,173.96	3,214.00	.....
Territorial institutions, forty-eighth fiscal year .....	.....	4,667.86	.....	4,667.86	.....	.....
Capitol rebuilding fund .....	.....	67,275.00	.....	.....	4,979.13	62,295.87
Bills payable .....	.....	8,600.00	.....	.....	.....	8,600.00
Total	77,849.36	139,522.20	64,729.40	64,729.40	73,718.19	143,653.37

RECAPITULATION.

Balances March 1, 1897	\$77,849.36
Receipts during quarter	139,522.20
Total to be accounted for	217,371.56
Payments during quarter	73,718.19
Balances May 29, 1897	143,653.37

DISPOSITION OF FUNDS.

First National Bank of Santa Fe	\$63,102.02
Bank of Commerce, Albuquerque	2,178.48
First National Bank of Las Vegas	8,089.82
First National Bank of Albuquerque	8,617.73
Taos County Bank	5,062.78
New Mexico Savings Bank and Trust Company	2,385.37
San Miguel National Bank	8,135.76
First National Bank of Raton	6,030.23
Bank of Roswell	5,121.29
National Bank of Commerce of New York	9,463.61
Western National Bank of New York	575.94
Cash items	82.35
Total	143,653.37
Funds not available	2,385.37
Funds available	141,268.00
Deduct interest due	9,463.61
Free cash balance	131,804.39

TERRITORY OF NEW MEXICO.

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Quarterly statement of the Territorial treasurer of New Mexico for the second quarter of the forty-eighth fiscal year, beginning May 31, 1897, and ended August 28, 1897.

Title of fund or account.	Balances May 31, 1897.	Receipts during quarter.	Transfers to funds.	Trans- fers from funds.	Payments during quarter.	Balances Aug. 28, 1897.
Interest fund	\$2,839.19		\$15,790.52		\$17,247.50	\$1,382.21
Licenses	1,061.49	\$1,585.58			150.00	2,497.07
Penitentiary current expense fund	8,301.57	1,935.25	12,494.24		11,490.63	11,230.43
Salary fund	8,519.31	2,497.65	8,793.44		9,076.60	10,733.80
Court fund	304.23		312.11		53.27	563.07
Miscellaneous fund	12,226.37		13,372.76		9,376.29	16,222.84
Compensation of assessors fund	476.95	3,107.49			2,191.88	1,392.56
Transportation of convicts	412.90		1,266.78		799.69	879.99
University of New Mexico	2,369.34		2,677.25		2,300.00	2,746.59
Agricultural college	636.51		1,784.82		636.51	1,784.82
New Mexico School of Mines	183.06		1,784.82		750.00	1,217.88
New Mexico Insane Asylum	29,329.15		4,015.83		10,614.85	22,730.13
Territorial normal institutes	39.34					39.34
Branch agricultural experiment station	18.93				18.93	
Cattle indemnity fund	1,169.59	4,759.26			4,613.62	1,315.23
School fund	386.44				218.80	167.64
Interest on deposits	305.06	418.57			274.72	448.91
Deficit fund, forty-second fiscal year	154.60					154.60
Deficiency fund, forty-sixth fiscal year	59.50				37.02	22.48
Special court fund	2,047.80				752.34	1,295.46
Normal school, New Mexico (Silver City)	633.03		1,784.82		1,204.46	1,213.39
Normal school, New Mexico (Las Vegas)	633.11		1,784.82		633.11	1,784.82
Territorial purposes, forty-seventh fiscal year		3,659.59		\$3,659.59		
Territorial institutions, forty-seventh fiscal year		1,066.11		1,066.11		
New Mexico Military Institute	650.03		1,784.82			2,434.85
Territorial purposes, forty-eighth fiscal year		49,880.26		49,880.26		
Territorial institutions, forty-eighth fiscal year		14,551.07		14,551.07		
Capitol rebuilding fund	62,295.87	5,850.00			2,079.46	66,066.41
Bills payable					8,600.00	
Corporation fund	8,600.00					
The legal expense fund		558.00			447.10	110.90
United States annual appropriation for agricultural college		23,000.00	1,500.00		269.75	1,230.25
						23,000.00
Total	143,653.37	112,848.83	69,137.03	69,137.03	83,836.53	172,065.67

RECAPITULATION.

Balances May 31, 1897	\$143,653.37
Receipts during quarter	112,848.83
Total to be accounted for	256,502.20
Payments during quarter	83,836.53
Balances August 28, 1897	172,665.67

DISPOSITION OF FUNDS.

First National Bank of Santa Fe	\$24,909.61
Bank of Commerce, Albuquerque	2,193.02
First National Bank of Las Vegas	29,742.92
First National Bank of Albuquerque	29,740.61
Taos County Bank	9,105.53
New Mexico Savings Bank and Trust Company	1,583.28
San Miguel National Bank	29,798.45
First National Bank of Raton	14,589.46
Bank of Roswell	14,443.92
National Bank of Commerce of New York	10,578.87
Total	172,065.67
Funds not available	1,583.28
Funds available	171,082.39
Deduct interest due	16,578.87
Free cash balance	154,503.52

Quarterly statement of the Territorial treasurer of New Mexico for the third quarter of the forty-eighth fiscal year, beginning August 30, 1897, and ended November 27, 1897.

Title of fund or account.	Balances Aug. 30, 1897.	Receipts during quarter.	Transfers to funds.	Trans- fers from funds.	Payments during quarter.	Balances Nov. 27, 1897.
Interest fund	\$1,382.21	\$15,000.00	\$3,298.83	.....	\$12,840.00	\$6,841.04
Licenses	2,497.07	83.77	.....	.....	163.00	2,417.84
Penitentiary current expense fund	11,230.43	4,882.34	2,501.04	.....	11,835.77	6,878.04
Salary fund	10,733.80	2,057.95	1,861.17	.....	9,320.48	5,332.44
Court fund	563.07	.....	64.57	.....	504.15	123.49
Miscellaneous fund	16,222.84	108.50	2,768.36	.....	8,060.40	11,039.30
Compensation of assessors fund	1,392.56	653.00	.....	.....	1,100.61	944.95
Transportation of convicts	879.99	.....	269.30	.....	791.62	357.67
University of New Mexico	2,746.59	.....	544.88	.....	2,500.00	791.47
Agricultural college	1,784.82	.....	363.25	.....	.....	2,418.07
New Mexico School of Mines	1,217.88	.....	363.25	.....	1,200.00	381.13
New Mexico Insane Asylum	22,730.13	.....	817.29	.....	17,730.13	5,817.29
Territorial normal institutes	39.34	.....	.....	.....	.....	39.34
Cattle indemnity fund	1,315.23	4,115.11	.....	.....	3,918.61	1,511.73
School fund	167.64	.....	.....	.....	139.30	28.34
Interest on deposits	448.91	929.14	.....	.....	.....	1,378.05
Deficit fund, forty-second fiscal year	154.60	.....	.....	.....	.....	154.60
Deficiency fund, forty-sixth fiscal year	22.48	.....	.....	.....	.....	22.48
Special court fund	1,295.46	.....	.....	.....	44.34	1,251.12
Normal school, New Mexico (Silver City)	1,213.39	.....	363.25	.....	1,213.39	363.25
Normal school, New Mexico (Las Vegas)	1,784.82	.....	363.25	.....	1,784.82	363.25
Territorial purposes, forty-seventh fiscal year .....	.....	2,196.46	.....	\$2,196.46	.....	.....
Territorial institutions, forty-seventh fiscal year .....	.....	640.78	.....	640.78	.....	.....
New Mexico Military Institute	2,434.85	.....	363.25	.....	2,400.00	398.10
Territorial purposes, forty-eighth fiscal year .....	.....	8,566.81	.....	8,566.81	.....	.....
Territorial institutions, forty-eighth fiscal year .....	.....	2,537.64	.....	2,537.64	.....	.....
Capitol rebuilding fund	66,066.41	.....	.....	.....	4,489.20	61,577.21
Corporation fund	110.90	507.00	.....	.....	520.30	97.60
The legal expense fund	1,230.25	.....	.....	.....	1,002.50	227.75
United States annual appropriation for agricultural college	23,000.00	.....	.....	.....	.....	23,000.00
Territorial purposes, forty-ninth fiscal year .....	.....	567.48	.....	.....	.....	567.48
Territorial institutions, forty-ninth fiscal year .....	.....	180.51	.....	.....	.....	180.51
Capitol contingent sinking fund .....	.....	40.52	.....	.....	.....	40.52
Special tax .....	.....	101.33	.....	.....	.....	101.33
Sheep sanitary fund .....	.....	15.38	.....	.....	.....	15.38
Total	172,665.67	43,283.72	13,941.60	13,941.69	81,558.62	134,390.77

RECAPITULATION.

Balances August 30, 1897	\$172,665.67
Receipts during quarter	43,283.72
Total to be accounted for	215,949.39
Payments during quarter	81,558.62
Balances November 27, 1897	134,390.77

DISPOSITION OF FUNDS.

First National Bank of Santa Fe	\$19,705.48
Bank of Commerce, Albuquerque	2,209.86
First National Bank of Las Vegas	22,940.79
First National Bank of Albuquerque	22,950.91
Taos County Bank	8,172.63
New Mexico Savings Bank and Trust Company	1,583.28
San Miguel National Bank	23,010.20
First National Bank of Raton	12,676.27
Bank of Roswell	12,547.89
National Bank of Commerce of New York	8,593.96
Total	134,390.77
Funds not available	1,583.28
Funds available	132,807.49
Deduct interest due	8,593.96
Free cash balance	124,213.53

Quarterly statement of the Territorial treasurer of New Mexico, fourth quarter of the forty-eighth fiscal year, beginning November 29, 1897, and ending March 5, 1898.

Title of fund or account.	Balances Nov. 29, 1897.	Receipts during quarter.	Transfers to funds.	Transfers from funds.	Payments during quarter.	Balances Mar. 5, 1898.
Interest fund.....	\$6,841.04		\$22,540.83		\$16,877.50	\$12,504.37
Licenses.....	2,417.84	\$60.17		\$2,344.73	133.28	
Penitentiary current expense fund.....	6,878.04	2,397.80	14,504.51	3.11	7,882.23	15,894.51
Salary fund.....	5,332.44	2,226.24	14,816.75		7,918.65	14,456.78
Court fund.....	123.49		413.26		58.80	477.95
Miscellaneous fund.....	11,039.30		17,217.35	12.69	7,853.46	20,390.50
Compensation of assessors fund.....	944.95	4,607.55			4,016.38	1,536.12
Transportation of convicts.....	357.67		1,784.59		357.67	1,784.59
University of New Mexico.....	791.47		3,029.76		750.00	3,071.23
Agricultural college.....	2,148.07		2,019.81		2,148.07	2,019.81
New Mexico School of Mines.....	381.13		2,019.81		1,280.00	1,120.94
New Mexico Insane Asylum.....	5,817.29		7,168.05		9,475.82	3,509.52
Territorial normal institutes.....	39.34			39.34		
Cattle indemnity fund.....	1,511.73	5,826.64			4,249.57	3,088.80
School fund.....	28.34				28.34	
Interests on deposits.....	1,378.05	769.81				2,147.86
Deficit fund, forty-second fiscal year.....	154.60					154.60
Deficiency fund, forty-sixth fiscal year.....	22.48				19.48	3.00
Special court fund.....	1,251.12				3.51	1,247.61
Normal school, New Mexico (Silver City).....	363.25		2,019.81		1,338.86	1,044.20
Normal school, New Mexico (Las Vegas).....	363.25		2,019.81			2,383.06
Territorial purposes, forty-seventh fiscal year.....		1,998.67		1,998.67		
Territorial institutions, forty-seventh fiscal year.....		583.66		583.66		
New Mexico Military Institute.....	398.10		2,019.81			2,417.91
Territorial purposes, forty-eighth fiscal year.....		6,110.67		6,110.67		
Territorial institutions, forty-eighth fiscal year.....		1,786.23		1,786.23		
Capitol rebuilding fund.....	61,577.21				3,225.92	58,351.29
Corporation fund.....	97.60	769.00			659.00	207.60
The legal expense fund.....	227.75					227.75
United States annual appropriation for agricultural college.....	23,000.00				23,000.00	
Territorial purposes, forty-ninth fiscal year.....	567.48	60,200.60		60,768.08		
Territorial institutions, forty-ninth fiscal year.....	180.51	17,746.46		17,926.97		
Capitol contingent sinking fund.....	40.52	4,479.90				4,520.42
Special tax.....	101.33	10,517.78				10,619.11
Sheep sanitary fund.....	15.38	588.23				601.61
Total.....	134,390.77	120,666.91	91,574.15	91,574.15	91,276.54	163,781.14

RECAPITULATION.

Balances November 29, 1897.....	\$134,390.77
Receipts during quarter.....	120,666.91
Total to be accounted for.....	255,057.68
Payments during quarter.....	91,276.54
Balances March 5, 1898.....	163,781.14

DISPOSITION OF FUNDS.

First National Bank of Santa Fe.....	\$14,266.77
Bank of Commerce, Albuquerque.....	2,226.84
First National Bank of Las Vegas.....	29,503.89
First National Bank of Albuquerque.....	29,490.28
Taos County Bank.....	9,734.07
New Mexico Savings Bank and Trust Company.....	1,583.28
San Miguel National Bank.....	29,476.70
First National Bank of Raton.....	14,772.47
The Bank of Roswell.....	14,641.71
National Bank of Commerce of New York.....	18,085.13
Total.....	163,781.14
Funds not available.....	1,583.28
Funds available.....	162,197.86
Deduct interest due.....	18,085.13
Free cash balance.....	144,112.73

Quarterly statement of the Territorial treasurer of New Mexico, first quarter of the forty-ninth fiscal year, beginning March 7, 1898, and ending May 28, 1898.

Title of fund or account.	Balances Mar. 7, 1898.	Receipts during quarter.	Transfers to funds.	Transfers from funds.	Payments during quarter.	Balances May 28, 1898.
Interest fund	\$12,504.37		\$5,187.26		\$12,500.00	\$5,191.60
Licenses		\$3.07				3.00
Penitentiary current expense fund	15,894.51	1,901.49	3,414.71		6,591.60	14,619.11
Salary fund	14,456.78	2,241.10	2,886.95		8,284.05	11,300.78
Court fund	477.95		96.12		92.00	482.00
Miscellaneous fund	20,390.50		4,021.81		10,186.94	14,225.33
Compensation of assessors fund	1,536.12	1,046.35			1,528.52	1,053.95
Transportation of convicts	1,781.59		413.88		1,774.44	424.00
University of New Mexico	3,071.23		719.11		3,000.00	790.33
Agricultural college	2,019.81		479.40		2,019.81	479.40
New Mexico School of Mines	1,120.94		479.40		1,000.00	600.33
New Mexico Insane Asylum	3,509.52		1,600.32		3,509.52	1,600.33
Cattle indemnity fund	3,088.80	2,223.49			4,470.99	841.30
Interests on deposits	2,147.86	822.80			500.00	2,470.66
Deficit fund, forty-second fiscal year	154.60					154.60
Deficiency fund, forty-sixth fiscal year	3.00				3.00	
Special court fund	1,247.61					1,247.61
Normal school, New Mexico (Silver City)	1,044.20		479.40		1,044.20	479.40
Normal school, New Mexico (Las Vegas)	2,383.06		479.40		2,383.06	479.40
Territorial purposes, forty-seventh fiscal year		1,048.31		\$1,048.31		
Territorial institutions, forty-seventh fiscal year		305.47		305.47		
New Mexico Military Institute	2,417.91		479.40		2,400.00	497.31
Territorial purposes, forty-eighth fiscal year		2,900.57		2,900.57		
Territorial institutions, forty-eighth fiscal year		846.21		846.21		
Capitol rebuilding fund	58,351.29				5,027.29	53,324.00
Corporation fund	207.60	1,021.00			588.16	640.44
The legal expense fund	227.75					227.75
Territorial purposes, forty-ninth fiscal year		12,071.85		12,071.85		
Territorial institutions, forty-ninth fiscal year		3,564.75		3,564.75		
Capitol contingent sinking fund	4,520.42	856.72				5,377.14
Special tax	10,619.11	2,139.63			9,377.64	3,381.10
Sheep sanitary fund	601.61	264.10				865.71
Compilation fund		161.50				161.50
Total	163,781.14	33,418.41	20,737.16	20,737.16	76,281.22	120,918.33

RECAPITULATION.

Balances March 7, 1898	\$163,781.14
Receipts during quarter	33,418.41
Total to be accounted for	197,199.55
Payments during quarter	76,281.22
Balances May 28, 1898	120,918.33

DISPOSITION OF FUNDS.

First National Bank of Santa Fe	\$1,886.47
Bank of Commerce, Albuquerque	2,243.30
First National Bank of Las Vegas	20,683.20
First National Bank of Albuquerque	20,670.90
Taos County Bank	7,100.00
New Mexico Savings Bank and Trust Company	1,583.20
San Miguel National Bank	20,659.40
First National Bank of Raton	10,070.90
The Bank of Roswell	10,040.70
National Bank of Commerce of New York	25,979.80
Total	120,918.33
Funds not available	1,583.20
Funds available	119,335.05
Deduct interest due	25,979.82
Free cash balance	93,355.23

Assessment of property for taxes for the year 1897 in the various counties in the Territory of New Mexico and the arithmetical product of taxes for the forty-ninth fiscal year.

County.	Assessed value subject to tax.	Territorial purposes.	Territorial institutions.	Special tax.	Capitol contingent fund.	Cattle indemnity.	Sheep sanitary.
Bernalillo	\$7,395,184.00	\$51,766.29	\$15,160.29	\$9,243.98	\$3,697.59	\$7.74	\$217.76
Chaves	1,475,829.00	10,330.81	3,025.47	1,844.78	737.91	704.04	131.93
Colfax	2,722,180.00	19,055.26	5,580.46	3,402.72	1,361.09	302.09	81.54
Donna Ana	2,446,662.85	17,126.85	5,015.72	3,068.37	1,223.35	60.82	26.87
Eddy	1,113,075.00	7,792.99	2,280.96	1,391.01	559.79	59.13	75.57
Grant	3,468,236.45	24,277.65	7,109.88	4,335.29	1,734.11	1,040.47	31.11
Guadalupe	420,558.00	2,943.84	862.12	525.67	210.26	51.75	219.60
Lincoln	1,413,832.00	9,898.26	2,898.65	1,767.48	707.46	862.65	124.24
Mora	968,135.00	6,776.94	2,420.33	1,210.16	484.06	83.06	107.18
Rio Arriba	800,222.00	5,601.55	1,640.45	1,000.27	400.11	19.50	179.25
San Juan	729,310.00	5,105.17	1,495.08	911.64	864.65	13.21	29.78
San Miguel	4,209,564.00	29,466.94	8,628.56	5,262.05	2,104.45	67.95	285.52
Santa Fe	1,851,701.00	12,961.17	3,794.62	2,317.27	927.62	23.37	72.19
Sierra	1,065,072.30	7,885.52	2,162.90	1,318.84	527.53	164.63	21.81
Socorro	4,611,482.00	32,280.40	9,453.52	5,764.36	2,305.75	613.93	167.61
Taos	953,689.00	6,675.82	2,002.75	1,144.43	476.84	157.72	107.60
Union	1,174,850.00	8,223.95	2,937.12	1,468.56	587.42	170.29	354.37
Valencia	2,668,506.58	18,680.10	5,470.79	3,335.86	1,334.63	16.43	69.10

Total assessed value of all kinds of property..... \$41,546,493.47
 Deduct exemptions to heads of families and reductions on values made by board of county commissioners and Territorial board of equalization..... 2,068,374.29

Balance of property valuation subject to tax..... 39,478,119.18

For Territorial purposes (section 2, chapter 72, Laws of 1897), 7 mills on the dollar.
 For Territorial institutions (section 5, chapter 72, Laws of 1897), $2\frac{1}{16}$ of one mill on the dollar.
 For special tax for the forty-ninth fiscal year (section 7, chapter 72, Laws of 1897), $1\frac{1}{4}$ mills on the dollar.
 For capitol contingent sinking fund (section 3, chapter 45, Laws of 1887), $\frac{1}{4}$ mill on the dollar.
 For cattle indemnity fund, as provided by section 23, chapter 106, Laws of 1889.
 For the support of the public schools a levy is made by me in conformity with "An act to establish public schools in the Territory," etc., approved February 12, 1891, of $2\frac{1}{16}$ of one mill on the dollar upon all the taxable property in the Territory, to be collected and paid in to the different county treasuries, as provided by law.

COUNTY FINANCES.

I have made stringent efforts to ascertain the amount of indebtedness existing in the various counties of the Territory, and the present financial condition thereof, but regret to say that I have been unable to get this information from all of the counties. Following, I give such reports as I have succeeded in obtaining.

COLFAX COUNTY.

General county fund:
 Receipts.....\$13,372.32
 Expenditures.....10,071.46
 Balance on hand.....3,300.86

Court fund:
 Receipts.....5,834.84
 Expenditures.....4,601.50
 Balance on hand.....1,233.34

Bounty fund:
 Receipts.....1,502.69
 Expenditures.....1,368.78
 Balance on hand.....133.91

General interest fund:
 Receipts.....7,815.87
 Expenditures.....4,854.11
 Balance on hand.....2,961.76

General schools fund:

Receipts	\$14, 496. 71
Expenditures	11, 461. 44
Balance on hand	3, 035. 27

Roads and bridge fund:

Receipts	1, 499. 73
Expenditures	1, 403. 59
Balance on hand	96. 14

FINANCIAL STATEMENT OF BERNALILLO COUNTY.

Total indebtedness of said county up to and including June 30, 1898, amounts to \$353,459.23, composed of the following amounts, viz:

Bonded debt.

Date issued.	What purpose issued.	Rate of interest.	Amount issued.
		<i>Per cent.</i>	
1884.....	Funding indebtedness.....	6	\$25, 000. 00
1885.....	Court-house and jail.....	7	92, 000. 00
July 1, 1889.....	Funding indebtedness.....	6	40, 000. 00
Do.....	Current expenses.....	6	40, 000. 00
July 1, 1891.....	Funding indebtedness.....	5, 3/4	17, 000. 00
Nov. 16, 1892.....	Current expenses.....	6	7, 000. 00
Do.....	Bridge building.....	6	30, 000. 00
July 1, 1895.....	Funding indebtedness.....	6	64, 900. 00
July 1, 1897.....	do.....	6	50, 300. 00
	Less bonds of 1884 and 1885 paid.....		366, 200. 00
	Total.....		18, 000. 00
	Approved accounts, quarter ending—		348, 200. 00
September 30, 1897, 50 per cent unpaid.....			2, 568. 44
March 31, 1898, 40 per cent unpaid.....			2, 690. 79
Warrants outstanding.....			
Judgments against the county.....			
County certificates of indebtedness.....			
Floating indebtedness.....			
Total indebtedness.....			833, 459. 23
Total assessed valuation, real and personal, equalized for the year 1897.....			7, 395, 184. 00

FINANCIAL CONDITION OF CHAVES COUNTY.

Bonded indebtedness.

Court-house and jail bonds outstanding and drawing 6 per cent.....	\$30, 000. 00
Lincoln County indebtedness bonds outstanding and drawing 6 per cent.....	13, 000. 00
Current expense bonds outstanding and drawing 6 per cent.....	7, 000. 00
Total.....	50, 000. 00
General fund, balance on hand.....	6, 338. 92
Road and bridge fund, balance on hand.....	685. 71
School fund, balance on hand.....	1, 889. 40
Bonded interest fund, balance on hand.....	804. 85
District court fund, balance on hand for the fiscal year ending June 30, 1898.....	365. 45

FINANCIAL STATEMENT OF DONNA ANA COUNTY.

Bonds issued:

November 1, 1883, court-house and jail bonds, 6 per cent ..	\$3, 000. 00
July 1, 1889, current expense bonds, 6 per cent.....	15, 000. 00
July 1, 1891, current expense bonds, 6 per cent.....	7, 000. 00
January 1, 1885, funding bonds, 6 per cent.....	10, 900. 00
July 1, 1889, funding bonds, 6 per cent.....	32, 000. 00
July 1, 1895, funding bonds, 6 per cent.....	23, 100. 00
August 2, 1897, funding bonds, 6 per cent.....	7, 621. 15
Judgments.....	3, 144. 13

101, 765. 28

By credits:

Cash on hand court-house bonds sinking fund	\$3,000.00	
Cash on hand funding bonds sinking fund, issue of 1885..	5,921.95	
		<hr/>
		\$8,921.95

Floating outstanding indebtedness, 1896.....	92,843.33	
Floating outstanding indebtedness, 1897.....	587.92	
		<hr/>
		3,935.86

FINANCIAL STATEMENT OF EDDY COUNTY.

The chairman of the board of county commissioners of the county of Eddy writes that—

the financial condition of that county is in better shape than it has been for years. One year ago, under the laws of the last legislature, we bonded the Territorial indebtedness (not before bonded), which amounts to \$23,925.84.

Indebtedness for court-house, jail bonds, bridge bonds, and Lincoln County indebtedness, amounting to \$50,000, running from twenty to thirty years.

Since the issuance of our last bonds, we have been paying the court expenses of the county in full.

FINANCIAL STATEMENT OF GRANT COUNTY.

Funding bonds 1882, at 6 per cent	\$100
Railroad bonds 1883, at 7 per cent	57,000
Funding bonds 1885, at 6 per cent	18,500
Funding and refunding bonds 1889, at 6 per cent.....	142,500
	<hr/>
	218,100
Unfunded indebtedness, more or less	20,000
	<hr/>
	238,100

AUDITOR'S OFFICE, TERRITORY OF NEW MEXICO,
Santa Fe, N. Mex., August 11, 1898.

SIR: In reply to your letter of the 6th instant, I beg to submit the following statement of the taxable property for 1897:

TAX RATE FOR 1897.

Tax rate for 1897 on assessed valuation of property.

	Mills.
For Territorial purposes	7
For Territorial institutions.....	2.05
Special tax for the forty-ninth fiscal year.....	1.25
Capitol contingent bonds .....	.50

Territorial expenditures for the forty-ninth fiscal year, according to the tax roll of 1897.

For Territorial purposes	\$100,055.60
For Territorial institutions	31,491.67
Appropriations	193,080.00

I regret that I can not give you a fuller report at this time, but owing to the failure of the counties to respond, I can not, and hope this will answer.

Very respectfully,

MARCELINO GARCIA, *Territorial Auditor.*

The GOVERNOR OF NEW MEXICO,
Santa Fe, N. Mex.

BOARD OF EQUALIZATION.

TERRITORIAL VALUATIONS FOR 1898.

Lands and real estate.—All workable coal lands situated not more than 10 miles from any operated railroad shall be assessed at \$20 per acre; more than 10 miles from line of railroad, \$10 per acre; merchantable timber lands not more than 15 miles from line of railroad, \$3.50 per acre; more than 15 miles from railroad, \$1.50 per acre. Each quarter

section or fractional part thereof of land with permanent water, suitable for grazing only, \$1.25 per acre; grazing lands without water, 30 cents per acre; all other lands and real estate not otherwise specified, at actual cash value, but under no circumstances shall they be assessed for less than other similar or adjacent property.

Live stock.—The board placed the assessable values upon live stock as follows: Stock horses, \$5 per head; cow ponies, \$10 per head; American horses, \$30 per head; American mules, \$40 per head; Mexican mules, \$10 per head; burros, \$3 per head; stock cattle south of the thirty-fifth parallel, \$11 per head; stock cattle north of the thirty-fifth parallel, \$12 per head; improved sheep within the Territory of New Mexico, \$1.50 per head; the unimproved sheep within the Territory of New Mexico, at \$1 per head; graded Angora goats, that produce a fleece that is clipped for market, shall be assessed at the rate of \$2 per head; common goats that produce no clip or fleece shall be assessed at 50 cents per head; improved cattle that are suitable for dairy purposes only shall be assessed at \$25 per head.

BANKS.

The statements of the different banks throughout the Territory show the following business for the fiscal year ending June 30, 1898:

First National Bank of Albuquerque.....	\$1, 851, 461. 00
First National Bank of Las Vegas.....	603, 361. 91
First National Bank of Santa Fe.....	643, 741. 98
First National Bank, Raton.....	203, 741. 98
San Miguel National Bank, Las Vegas.....	642, 778. 30
Las Vegas Savings Bank.....	98, 325. 68
Silver City National Bank.....	234, 354. 29
The Bank of Commerce, Albuquerque.....	370, 023. 24
Sierra County Bank, Hillsboro.....	113, 409. 65
Bank of Roswell, Roswell.....	291, 258. 06
Bank of Deming, Deming.....	168, 916. 67
Exchange Bank of White Oaks.....	93, 277. 78
George D. Bowman & Son, Las Cruces.....	68, 095. 62
Andrew Morton & Co., Springer.....	58, 000. 00
Taos County Bank, Taos.....	72, 410. 34

INTERNAL REVENUE SERVICE, DISTRICT OF NEW MEXICO, COLLECTOR'S OFFICE, *Santa Fe, N. Mex., September 22, 1898.*

DEAR SIR: In response to yours of the 10th instant, I have the honor to submit herewith a statement of the collections for the district of New Mexico from the various sources enumerated below, viz:

Wholesale liquor dealers.....	\$991. 67
Wholesale dealers in malt liquors.....	1, 487. 53
Retail liquor dealers.....	13, 370. 78
Retail dealers in malt liquors.....	281. 68
Retail dealers in oleomargarine.....	224. 00
Brewers (more than 500 barrels).....	100. 00
Brewers (less than 500 barrels).....	50. 00
Rectifiers (less than 500 barrels).....	83. 34
Other stamps—	
Beer stamps.....	4, 320. 88
Cigar and cigarette stamps.....	1, 256. 25
Tobacco stamps.....	54. 00
Tax-paid and spirit stamps.....	713. 46
Adhesive stamps.....	2, 695. 45
Penalties and miscellaneous collections.....	717. 10
Total.....	26, 346. 14

Very respectfully,

A. L. MORRISON.

Hon. M. A. OTERO, *Santa Fe, N. Mex.*

REPORT OF THE TERRITORIAL COAL-OIL INSPECTOR.

SIR: As per your request of recent date, herewith please find statement showing the number of gallons of coal oil or kerosene shipped into New Mexico from June 30, 1897, up to and including June 30, 1898.

	Gallons.
Las Vegas station	75, 036
Santa Fe station	28, 915
Albuquerque station	126, 988
Socorro station	35, 084
Las Cruces station	24, 922
Lake Valley station	7, 813
Deming station	31, 628
Silver City station	50, 728
Eddy station	25, 208
All other sources	105, 623
Total	511, 945

Very respectfully,

JOHN S. CLARK,
Coal-Oil Inspector New Mexico.

Governor MIGUEL A. OTERO,
Santa Fe, N. Mex.

EDUCATIONAL.

SANTA FE, N. MEX., *August 1, 1898.*

SIR: I have the honor to acknowledge receipt of your favor of recent date asking for information as to the condition of the schools of this Territory up to June 30, 1898. Complying with your request, I have to say that since the date of the last report submitted by this office there has been marked progress in educational matters throughout the Territory. The public school institution has been in operation long enough to show its beneficial effects. The accompanying statement will give an insight as to the amount of work done in each county. Some attention has been given to the building of new school houses, particularly in the larger cities. In a great many of the country districts old buildings have been enlarged and improved. So far as the quality and quantity of the work of the schools has been affected by the character of the teachers, there has been great improvement. This is due in a great measure to the normal training which many of the present teachers have received during the last few years.

The adoption of a uniform series of text-books for the public schools has brought about very satisfactory results.

The history of the free public schools in New Mexico during the last few years is such as to afford gratification and pride to every citizen of the Territory. As the number of primary or elementary schools is the gauge by which the progress of a State must be measured, New Mexico in this particular has achieved much more than the greatest friends of our educational system ever dared to hope. It is not only in the district schools that New Mexico can present itself in a favorable light. Our city schools are second to none in the country.

Our Territorial institutions of learning are in a very flourishing condition, as will appear from an examination of the accompanying tables.

Besides our public schools, private interest has not been lacking. In addition to the public schools, there are in New Mexico many private and sectarian schools which have aided materially in the educational advancement of the Territory.

In conclusion, I desire to dispel the false ideas current in reference to the illiteracy and the inability to speak English with which the inhabitants of the Territory are wrongfully charged.

ILLITERACY.

Total illiterate population 10 years of age and over, by States and Territories, 1890.

	Per cent.		Per cent.
Maine.....	5.46	Missouri.....	9.09
New Hampshire.....	6.81	North Dakota.....	5.98
Vermont.....	6.69	South Dakota.....	4.22
Massachusetts.....	6.22	Nebraska.....	3.11
Rhode Island.....	9.76	Kansas.....	3.99
Connecticut.....	5.28	Kentucky.....	21.65
New York.....	5.53	Tennessee.....	26.64
New Jersey.....	6.50	Alabama.....	41
Pennsylvania.....	6.78	Mississippi.....	39.98
Delaware.....	14.31	Louisiana.....	45.83
Maryland.....	15.70	Texas.....	19.74
District of Columbia.....	13.20	Oklahoma.....	5.37
Virginia.....	30.18	Arkansas.....	26.65
West Virginia.....	14.41	Montana.....	5.46
North Carolina.....	35.71	Wyoming.....	3.41
South Carolina.....	44.95	Colorado.....	5.24
Georgia.....	39.83	New Mexico.....	44.49
Florida.....	27.79	Arizona.....	23.41
Ohio.....	5.24	Utah.....	5.59
Indiana.....	6.32	Nevada.....	12.81
Illinois.....	5.25	Idaho.....	5.14
Michigan.....	5.92	Washington.....	4.27
Wisconsin.....	5.73	Oregon.....	4.13
Minnesota.....	6.03	California.....	7.67
Iowa.....	3.61		

The large percentage, 44.49, given by the census report of 1890, is to a great extent due to the fact that in 1890 there were still living many of the original inhabitants who were living in the Territory before it became a part of the United States. It can be safely estimated that at least 22 per cent of the 44 per cent can be ascribed to them. This class of pioneers is fast disappearing and the new generation, without exception, owing to our excellent school system, is enjoying all the benefits of modern education, and this element has made excellent use of the facilities afforded during the last seven years, as a total enrollment of 151,000 in the district schools alone proves. This enrollment gives an average of 50 per cent of the total school census of 316,000, and considering that by the laws of the Territory this census embraces all persons of the ages between 6 and 21 years, but that the majority attending school is of 8 to 16 years; and further considering the fact that at least 70 per cent of the 70,000 new arrivals are above 20 years, it may be safely asserted that there is not a child in the Territory, between the ages of 8 and 16, who fails to attend school. Taking 50,000 as the number of persons of school age, 90 per cent is a conservative estimate of those able to read and write. Taking as a basis the census of 1890, with 153,000 inhabitants, the Territory has had, during the last seven years, an increase of 90,000, for the actual number of its inhabitants is to-day 243,000.

Of this increase of 90,000, 20,000 may be assigned to births and 70,000 to immigrants from other States of the Union. Of these last 70,000 at least 60,000 are able to read and write, which leaves only 14 per cent of illiteracy among the new arrivals.

Deducting the increase of 90,000 from the total of population of 243,000 leaves 153,000, of which 50,000 are of school age and 103,000 above 21 years of age.

Of the older inhabitants there were, according to the last census, in round numbers, 55 per cent able to read and write; but taking into consideration the deaths of persons above school age occurring during this period of seven years, and the increase of this class by those who, during their minority, attend school, this percentage can now be conservatively estimated at 60 per cent.

Consequently, the matter of persons able to read and write in New Mexico can be represented by the following figures:

	Number.	Percent.
New arrivals, 1890-1897.....	70,000	86
Persons of school age, 6 to 21 years.....	50,000	90
Persons above school age.....	103,000	60
Persons below school age.....	223,000	236
Total.....	20,000	.....
	243,000	.....

Or on an average, in round numbers, of 79 per cent able to read and write, leaving only 21 per cent of illiteracy.

ENGLISH.

In reference to the knowledge of the English language, the following facts will explain themselves and dispel the idea that English only to a slight extent is spoken in the Territory.

The census of 1890 gives 61.11 as the percentage of those unable to speak English; the same factors proving the decrease of illiteracy also prove the increase of the English language.

First, there is the death rate of the original settlers; second, an immigration of 70,000, all of which with hardly an exception speak English and are of Anglo-Saxon descent; third, a total enrollment embracing seven years of 151,000 in 550 schools, taught by 745 teachers each and everyone speaking and teaching English.

From the above facts a conservative estimate can be made proving that to-day the percentage of the inhabitants of the Territory unable to speak English will not at the utmost exceed 15 per cent.

Very respectfully, yours,

MANUEL C. DE BACA,
Superintendent of Public Instruction.

Hon. MIGUEL A. OTERO,
Governor of New Mexico, Santa Fe, N. Mex.

Annual report of the superintendent of public instruction for the year 1897.

DISTRICT SCHOOLS.

Counties.	Number of districts.	Teachers.			Enrollment.		
		Males.	Females.	Total.	Males.	Females.	Total.
Bernalillo.....	50	39	25	64	1,607	1,703	3,310
Chaves.....	11	2	16	18	276	292	568
Colfax.....	26	20	20	40	570	684	1,254
Doña Ana.....	29	7	21	28	685	513	1,198
Eddy.....	13	8	9	17	261	292	553
Grant.....	30	11	32	43	657	501	1,158
Guadalupe.....	13	13	.....	13	813	231	544
Lincoln a.....	35	17	10	27	388	307	695
Mora.....	27	7	5	12	399	240	639
Rio Arriba.....	22	22	3	25	621	251	772
San Juan.....	19	8	10	18	807	204	511
San Miguel.....	93	57	32	89	2,092	1,425	3,517
Santa Fe.....	27	18	5	33	715	414	1,129
Sierra.....	17	10	14	24	270	205	495
Socorro b.....	49	28	14	42	1,052	764	1,816
Taos c.....	32	15	3	18	456	192	648
Union.....	18	8	4	12	236	167	403
Valencia.....	21	18	5	23	864	620	1,474
Total.....	523	308	238	546	11,659	9,015	20,674
Total, 1896.....	562	313	215	528	11,875	8,316	20,191
Totals, 1891, 1892, 1893, 1894 and 1896.....		1,677	968	2,665	65,517	43,945	109,462
Grand total.....		2,298	1,441	3,739	89,051	61,276	150,327

a Difference not accounted for in expenditures, \$247.96.

b In total expenditures are included \$2,329.29, amount overdrawn.

c Total expenditures include \$172.86, over draft.

Annual report of the superintendent of public instruction for the year 1897—Continued.

DISTRICT SCHOOLS—Continued.

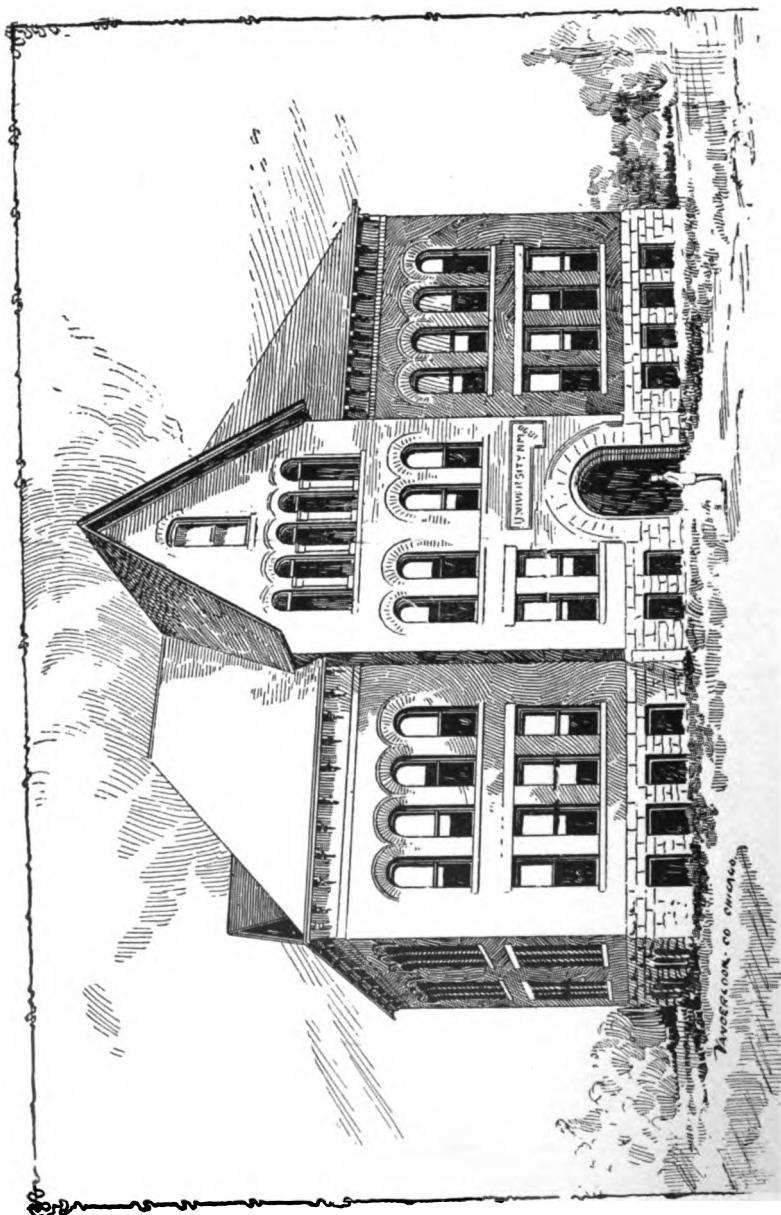
Counties.	Average daily attendance.			Number of scholars between the ages of 5 and 21 years.			Number of schools.	Months taught.
	Males.	Females.	Total.	Males.	Females.	Total.		
Bernalillo.....	1,072	902	1,974	3,954	3,365	7,319	58	4
Chaves.....	217	244	461	508	474	984	15	5
Colfax.....	382	332	714	1,144	133	1,277	29	4
Doña Ana.....	418	280	698	1,925	1,667	3,592	24	4
Eddy.....	1,653	1,962	3,615	389	462	851	14	4
Grant.....	434	320	754	1,558	1,299	2,857	30	5
Guadalupe.....	264	197	461	641	639	1,280	13	3
Lincoln a.....	230	219	449	1,025	687	1,712	21	3
Mora.....	268	164	432	1,512	1,390	2,902	13	4
Rio Arriba.....	366	132	498	498	253	751	24	3
San Juan.....	199	148	347	446	351	797	18	3
San Miguel.....	1,380	958	2,338	3,825	3,110	6,935	75	4
Santa Fe.....	506	295	801	1,380	1,226	2,606	31	3
Sierra.....	155	114	269	525	420	945	13	4
Socorro b.....	683	523	1,206	2,079	1,652	3,731	42	4
Taos c.....	273	118	391	899	774	1,673	15	4
Union.....	165	114	279	635	497	1,132	10	4
Valencia.....	695	483	1,178	1,159	1,402	2,561	24	4
Total.....	9,341	7,504	16,845	24,102	19,801	43,903	469	4
Total, 1896.....	8,139	5,679	13,818	23,962	20,875	44,837	472	4
Totals, 1891, 1892, 1893, 1894, and 1895.....	45,284	29,872	75,156	124,127	103,749	227,876	2,414	4
Grand total.....	62,764	43,065	105,819	171,191	144,425	316,616	3,355	4

Counties.	Receipts.			
	Balance due Dec. 1, 1897.	From county school fund.	Poll tax, fines, etc.	Total.
Bernalillo.....	\$10,148.53	\$11,265.15	\$979.90	\$22,393.58
Chaves.....	1,560.50	3,039.61	1,704.04	6,304.15
Colfax.....	2,789.92	7,209.84	171.35	10,171.11
Doña Ana.....	2,138.84	4,484.00	1,423.34	8,046.18
Eddy.....	367.41	3,345.57	1,214.14	4,927.42
Grant.....	2,214.88	14,799.55	4,100.90	21,115.23
Guadalupe.....	1,269.07	370.88	590.77	2,230.70
Lincoln a.....	1,586.37	2,616.75	1,584.15	5,787.27
Mora.....	1,258.57	888.74	285.40	2,432.71
Rio Arriba.....	2,096.31	2,512.45	83.60	5,592.36
San Juan.....	627.12	165.27	863.63	1,656.12
San Miguel.....	6,704.94	4,881.62	5,444.30	17,030.86
Santa Fe.....	2,583.04	3,156.10	1,820.20	7,559.34
Sierra.....	1,385.84	1,834.20	1,271.76	4,491.80
Socorro b.....	5,832.00	2,446.00	3,450.32	11,738.22
Taos c.....	1,491.32	2,076.06	112.10	3,679.48
Union.....	702.01	1,323.00	4,350.01	6,375.02
Valencia.....	1,692.91	649.50	617.91	2,960.32
Total.....	47,350.48	67,064.27	30,076.82	144,491.57
Total, 1896.....	44,926.45	88,559.82	49,349.49	182,835.76
Totals, 1891, 1892, 1893, 1894, and 1895.....	288,518.90	583,450.22	360,317.43	1,032,286.55
Grand total.....	380,795.83	538,074.31	439,743.74	1,359,613.88

a Difference not accounted for in expenditures, \$247.96.

b In total expenditures are included \$2,329.29, amount overdrawn.

c Total expenditures include \$172.86, over draft.



UNIVERSITY OF NEW MEXICO, ALBUQUERQUE.

Annual report of the superintendent of public instruction for the year 1897—Continued.

DISTRICT SCHOOLS—Continued.

Counties.	Expenditures.				
	Teachers' wages.	Rent, fuel, etc.	School-houses and grounds.	On hand.	Total.
Bernalillo	\$11,126.21	\$1,683.53	\$103.26	\$9,490.58	\$22,393.58
Chaves	4,537.84	306.28	477.51	982.52	6,304.15
Colfax	6,024.65	373.56	581.47	3,191.43	10,171.11
Donna Ana	4,322.24	628.61	243.68	2,851.65	8,046.18
Eddy	3,732.76	477.24	150.25	567.17	4,927.42
Grant	12,618.27	270.75	550.46	7,923.71	21,363.19
Guadalupe	1,051.42	121.55	.90	1,056.83	2,230.70
Lincoln	4,158.66	271.61	298.31	1,068.49	5,787.27
Mora	1,355.87	202.37	.....	874.47	2,432.71
Rio Arriba	2,027.75	608.70	.....	2,955.91	5,592.36
San Juan	957.11	42.89	237.95	418.17	1,656.12
San Miguel	13,208.95	687.42	1,528.99	1,605.50	17,030.86
Santa Fe	3,756.30	1,091.36	.....	2,711.68	7,559.34
Sierra	2,737.50	265.76	121.00	1,367.54	4,491.80
Socorro	9,003.75	1,287.94	1,794.14	1,981.68	14,067.51
Taos	2,084.14	121.15	465.47	1,171.58	3,852.34
Union	2,579.70	407.36	1,145.84	2,242.12	6,375.02
Valencia	1,965.87	139.00	.....	855.45	2,960.32
Total	87,248.99	8,987.08	7,690.23	43,306.38	147,241.68
Total, 1896	107,410.60	13,390.46	12,691.93	47,354.94	180,847.93
Totals, 1891, 1892, 1893, 1894, and 1895 ..	452,893.13	104,508.51	121,737.64	353,147.27	1,032,286.55
Grand total	647,552.72	126,885.55	142,128.80	443,808.59	1,360,376.16

a Difference not accounted for in expenditures, \$247.96.

b In total expenditures are included \$2,329.29, amount overdrawn.

c Total expenditures include \$172.86, over draft.

Overdrawn, total, \$2,750.11.

TERRITORIAL INSTITUTIONS.

Name.	Number of schools.	Number of months taught.	Number of teachers.	Enrollment.	Total daily average.	Total receipts. a	Total expenditures. a	Total value of school property.	Total amount of salary paid to teachers.	Total amount paid for rent, fuel, lights, and miscellaneous.
University of New Mexico	1	9	7	80	70	\$11,169.50	\$10,989.88	\$37,025.43	\$8,134.00	\$2,855.38
New Mexico College of Agriculture and Mechanic Arts	1	10	17	190	175	57,618.63	43,502.20	64,500.00	20,161.38	2,334.82
New Mexico School of Mines	1	9	2	27	25	4,981.59	5,769.79	45,000.00	3,300.00	2,469.79
Normal School of New Mexico, at Silver City ..	1	.....	.....	.....	.....	10,503.01	9,696.91	20,000.00	3,700.05	5,996.91
Total	4	28	26	297	270	84,272.73	69,958.28	166,525.43	35,295.43	13,656.90

a Only give actual receipts and expenditures.

NOTE.—The Deaf and Dumb Asylum has been closed for lack of funds.

Annual report of the superintendent of public instruction for the year 1897—Continued.

CITY SCHOOLS.

Location.	Number of schools.	Number of months taught.	Number of teachers.	Census.	Enrollment.	Total daily average.	Total receipts.	Total expenditures.	Total value of school property.	Total amount of salary paid to teachers.	Total amount paid for lights, rent, fuel, and miscellaneous.	Total amount of interest on indebtedness.	Total amount of indebtedness.
Santa Fe	10	6	10	1,020	593	562							
Albuquerque	5	9	12	933	685		(a)						
East Las Vegas	3	9	12	722	611	477	\$7,968.74	\$8,065.00	\$15,000.00	\$6,990.00	\$320.00	\$150.00	\$16,000.00
Raton	2	9	9	874	570	311	7,762.02	8,160.28	25,000.00	5,506.25	2,654.03		
Silver City	1	9	5	623	389	245	5,611.67	5,120.61					
Socorro	2	8	5	540	385	224	2,349.82	4,066.71	25,000.00	2,755.00	336.96	902.24	16,716.89

a No data available.

SECTARIAN SCHOOLS—CATHOLIC.

Name and location.	Number of schools.	Number of months taught.	Number of teachers.	Enrollment.	Total daily average.	Value of school property.
San Miguel College, Santa Fe	1	10	8	88	80	\$40,000
Academy of Loretto, Santa Fe	1	10	4	60	50	34,000
De La Salle Institute, Las Vegas	1	10	3	100	95	10,000
St. Mary's Parochial School, Albuquerque	1	10	4	80	75	20,000
St. Vincent's Academy, Albuquerque	1	10	4	90	85	40,000
Sisters of Loretto Indian Boarding School, Bernillo	1	10	8	160	160	20,000
Convent of St. Joseph, Taos	1	10	4	100	90	3,000
Sacred Heart Academy, San Miguel	1	10	3	75	70	7,000
Convent of Mercy, Las Vegas	1	9	3	60	50	2,500
Academy Immaculate Conception, Las Vegas	1	10	6	135	120	6,000
Orphanage, Santa Fe	1	12	2	100	100	10,000
Our Lady of Guadalupe, Sapello	2	10	4	115	100	200
Mora Academy	1	10	5	110	100	5,000
Socorro	1	10	4	32	30	5,000
Las Cruces	1	10	4	40	30	5,000
Mesilla	1	10	2	40	30	5,000
Silver City	1	10	2	30	25	3,000
Los Alamos	1	10	2	35	30	2,000
Total	19	181	72	1,450	1,320	217,700

SECTARIAN SCHOOLS—METHODIST.

Albuquerque	3	9	5	55	45	\$10,000
Las Cruces	1	10	1	60		
Las Vegas	1	9	1	58	40	
Dulce	1	9	2	62	50	
Jewett	1		2			
Peralta	1		2	28	20	
Martinez	1	4	1	25	20	
Costilla	1	4	1	30	22	
Conejos	1	4	1	20	15	
Ranchitos	1	8	1	58	50	
Rio Bonito	1	4	1	30	22	
Total	13	67	18	426	284	10,000

SECTARIAN SCHOOLS—NEW WEST EDUCATIONAL COMMISSION.

New West Academy	1					\$25,000
Los Borelas	1	6	1	65	50	
Ranchos de Albuquerque	1		1	64	50	
Las Vegas Academy	1	10	5	85	70	19,000
Ranchos de Atlatco						
Total	4	22	7	219	170	44,000

Annual report of the superintendent of public instruction for the year 1897—Continued.

SECTARIAN SCHOOLS—PRESBYTERIAN.

Name and location.	Number of schools.	Number of months taught.	Number of teachers.	Enrollment.	Total daily average.	Value of school property.
Laguna.....	1	10	2	70	45	\$1,000
Albuquerque.....	1	10	5	50	50	3,000
Santa Fe.....	1	10	6	60	60	14,000
El Rito.....	1	10	1	60	50	1,000
Embudo.....	1	10	1	50	45	.....
Jemez Hot Springs.....	1	10	1	100	45	1,200
Las Cruces.....	1	10	2	100	80	1,500
La Costilla.....	1	10	1	35	20	.....
Arroyo Hondo.....	1	6	1	65	50	.....
Upper Arroyo Seco.....	1	6	1	50	45	.....
Peñasco.....	1	10	1	50	35	1,200
Buena Vista.....	.....	.....	.....	.....	.....	1,500
Cañon Bonito.....	1	10	2	100	75	1,000
Chaperito.....	1	10	1	60	40	600
Corrales.....	.....	.....	.....	.....	.....	1,200
Las Vegas.....	1	10	2	.....	.....	2,000
Los Lentas.....	1	6	1	70	45	.....
Mora.....	1	10	1	40	30	2,000
Pajarito.....	1	10	1	40	30	1,500
Placitas.....	1	10	1	30	28	500
Raton.....	1	10	2	200	160	1,600
Taos.....	1	10	1	50	40	1,800
Prado.....	1	10	1	70	60	500
El Rancho.....	1	10	2	130	100	1,800
Jarales.....	1	6	1	30	80	.....
Total.....	23	9	38	1,505	1,178	37,900

RÉSUMÉ OF SECTARIAN SCHOOLS.

Denomination.	Number of schools.	Number of months taught.	Number of teachers.	Enrollment.	Total daily average.	Value of school property.
Catholic.....	19	10	72	1,450	1,320	\$217,700
Methodist.....	13	7	18	426	284	14,000
New West.....	5	6	7	219	170	44,000
Presbyterian.....	23	9	38	1,505	1,178	37,900
Total.....	60	32	135	3,600	2,952	313,600

BAPTIST MISSION SCHOOL.

The Baptist Mission School at Velarde, N. Mex., is in charge of Rev. W. H. Rishel and Mrs. Rishel. It is supported by the American Baptist Home Mission Society.

There are between fifty and sixty pupils in attendance, Mrs. Rishel having charge of the primary pupils, and Mr. Rishel of the more advanced grades. The work is, as nearly as possible, the same as that done in good public schools. Reading, writing, spelling, geography, arithmetic, and languages are taught. The school has been in progress two years.

UNIVERSITY OF NEW MEXICO,
Albuquerque, N. Mex., August 1, 1898.

His Excellency MIGUEL A. OTERO,
Governor of New Mexico:

In accordance with your instructions of July 18, I beg to return the following report of the progress and condition of the University of New Mexico for the year ending June 30, 1898:

The year has been one of progress and extension in many ways. A question of policy confronted the institution at the threshold of its new development and, after due consideration, was frankly met. In a new country, at a distance from the older

educational institutions, and in a measure freed from the influence of criticism, the temptation is strong to lower the standards of admission and requirements for graduation. This course may be justified as promoting the greatest good of the largest number, and as a necessary concession to the difficulties which the student meets in securing the necessary preparatory training. But it was considered that the university occupies a unique position in the sisterhood of higher institutions—a position of responsibility and trust—and that from it the Territory might reasonably expect an adherence to the conventional and universally accepted standards of the best Eastern colleges. Accordingly, inasmuch as it does not seem appropriate for a young institution to set up educational ideals in opposition to the results of the experience and uniform agreement of the Eastern college associations, it was decided to accept the standards adopted by the New England group of colleges, and now prevailing, with slight modifications, in the majority of the State universities of the country. An inspection of the latest catalogue will show that the entrance requirements are higher than in most institutions of the Southwest, but the experience of the year has shown that our students can meet these requirements. After the test of practical use our faculty is unanimous in the belief that it is not only possible but expedient to adhere rigidly to the standards adopted. This change has resulted in the dropping of the lowest class in the preparatory department, though the university will continue to assist so far as possible such students as reach it with deficiencies in preparation. One result of the course pursued is to throw added responsibility upon the high schools, and it is expressly desired to encourage these schools throughout the Territory to strengthen their work, especially in the first two years, in order to enable the student to secure the proper amount and kind of preparation for entrance. In this connection it might be a most desirable step at this time to establish, in connection with the Territorial board of education, a high-school board, whose duty it should be to assist in securing coordination and uniformity in the work of all the high schools of the Territory, and the closest possible articulation of these schools with the higher institutions of learning. In many of the Western States the results of such coordination have been most salutary.

It was expected that the striking off of the lowest class would reduce the numbers in attendance, but it is gratifying to note that the attendance during the year has greatly increased. The total enrollment reached 145, of whom 108 were in the academic departments. More satisfactory than mere increase in numbers is the improvement in the quality of the work. The classical department has increased so that, in spite of the fact that German has been removed and placed on an independent foundation, additional instruction is needed and a chair of modern languages should be established. The normal department, which has been doing very useful work, has during the year been so strengthened that it has taken its place among the best in the land. Pedagogic work can always be done most economically in connection with regular collegiate instruction, both departments being gainers by the association. The entire faculty of the university is thus at the disposal of the normal department, and the embryo teacher not only feels the stimulus of the higher ideals of the collegiate work, but has the advantage of the opportunity of observing the actual methods of experienced and efficient teachers. In addition, an arrangement has been effected by which the young teacher acquires practical experience in a model or training school, where she has actual practice in the exercise of her profession under expert guidance. The model school stands in the same relation to the normal school that the clinic does to the medical college, and is equally indispensable. The course in this department has been extended, and compares favorably with any in the country. The commercial department has also been extended so as to embrace a full three-year course, and combines the usual studies of a business college with a thorough academic education.

The greatest changes have been made in the scientific departments, which, in a new country with undeveloped resources, may be said to form the index of the practical efficiency of an institution. Here the university is charged with a double function—that of imparting instruction suited to prepare the student to meet the practical conditions of his future home, and that of inaugurating researches that shall assist in the development of the resources of the Territory. In both these directions, which mutually assist each other, satisfactory progress has been made.

The teaching force has been strengthened by the appointment of Prof. E. P. Childs, late of Dennison University and the University of Michigan, to the chair of chemistry and physics, from which the biology has been permanently separated. This is an appointment which is reported with great satisfaction as a promise of increased efficiency. We are equally fortunate in the appointment of Prof. John Weinzirl, of the University of Wisconsin, as assistant professor of biology and director of the bacteriological laboratory. The latter has proven during the year a very useful and important adjunct to our work, and the researches now under way promise to attract the attention of the scientific world. In biology Mr. F. S. Maltby, late of Johns Hopkins, and Mr. G. E. Coghill, of Brown, have been carrying on independent investi-

gations, the results of which have been in part published in the scientific journals, and serve to show the opportunities afforded in this land of marvelous scientific advantages.

An extensive series of geological papers from the laboratories of the university has been appearing in the *American Geologist*, and is the beginning of a survey of the geological resources of the Territory, now well under way. Two parties from the institution have been in the field during the summer collecting material for this purpose, and a large collection of plants and animals, with a number of new species, has been made and will be stored at the university buildings. Already these collections are becoming known and will be consulted as the authentic types of the flora and fauna of the region.

In other lines the faculty of the university have contributed several hundred pages of original matter to the educational and scientific journals, thus bringing the country to the notice of the intelligent public. As a result a continual stream of inquiries reaches us on the part of prospective immigrants.

The work in English and history is very satisfactory, but has become so extensive that, in spite of the fact that assistance has been secured in oratory, it is imperative that the teaching force should be strengthened in this department, Professor Taylor being, like most of the faculty, seriously overworked.

The physical training of both men and women has been systematically undertaken, and the equipment of the gymnasium has been increased. The results of the physical measurements is to demonstrate in a most striking manner the wonderful effect of a residence on the part of young people upon the plateau in building up strong physiques, and especially in establishing a large lung capacity. This fact will go far toward obviating the possibility of collecting in the Territory a race of feeble-lunged descendants of immigrant invalids. During the year to come there will be regular military drill under the direction of an expert commandant, and students will receive credits for this as well as the physical-culture work.

A music department has been connected with the university which will supply a felt need, and result, as is hoped, in the building up of a well-equipped conservatory of music. The regents have begun the erection of a cottage for the use of the custodian, by which means two good laboratory rooms will be made available in the main building; but the needs in this direction far outrun any present prospect for relief, and it is earnestly hoped that the available resources of the institution may be immediately increased. Most of the changes and improvements so far noticed have been made possible by personal sacrifice and rigid economy, but it will be quite impossible to continue even the present amount of work without greater financial resources, and the research work can not be perpetually carried on by voluntary effort.

It may be added that the cooperation of students and faculty has been most gratifying, and all have accepted the limitations imposed by lack of means, and worked loyally for the upbuilding of the institution, and the executive officer can not refrain from the expression of grateful appreciation of the cordial and sympathetic cooperation afforded by the board of regents, faculty, students, and community. No jar or friction has marred the pleasure of the year, and we look forward to a future of healthful growth and usefulness, requiring only the financial support commensurate to our needs to place the university in a position to fitly represent the educational ideals of a great and cultivated commonwealth.

With grateful appreciation of the interest displayed by your administration in the success of the educational institutions of the Territory, all of the above is respectfully submitted.

C. L. HERRICK,
President of the University.

NEW MEXICO MILITARY INSTITUTE, ROSWELL, N. MEX.

History.—By act of the legislature the New Mexico Military Institute was in 1893 "constituted one of the educational institutions of the Territory." Regents were appointed by the governor, and a donation of 40 acres of land from Mr. J. J. Hagerman was accepted and set apart for a building site. In 1895 the legislature authorized the issue of bonds to the amount of \$15,000 for the erection of suitable buildings, and at same session further authorized an annual Territorial tax levy of twenty one-hundredths of one mill for the institute's maintenance. The income from this source should be something over \$7,000 per annum. In 1897, after negotiating the bonds, as provided in act of issue, the regents completed the buildings, and will open the school for students in September, 1898.

Location.—The school is located in Chaves County, just beyond the corporate limits of the town of Roswell, but within half a mile of the court-house. It would be difficult to find a better location for a military school. The Pecos Valley is now celebrated throughout the world as a health resort, and the abundant supply of fresh water from the great springs and artesian wells at Roswell renders the town one of the most desirable places of residence in the Territory. Considerable patronage from eastern States is not an unreasonable expectation. The school buildings are 3,700 feet above the sea, the best altitude obtainable, and for solid comfort and thoroughly modern conveniences are in keeping with the natural advantages. Few of the best Eastern boarding schools are so snugly built or so well furnished. The town of Roswell has a population of 2,000 people, cultivated, law-abiding, sober, and industrious. Most of the leading denominations have well-organized churches. The town maintains excellent graded schools; the moral and social influences are necessarily good. Roswell is on the Pecos Valley and Northeastern Railway, which now connects with the Texas and Pacific Railway at Pecos, Tex., and by December, 1898, will connect at Amarillo with the Santa Fe and the Fort Worth and Denver railways. It is also reached by a daily stage line from Lincoln, N. Mex., and a triweekly stage from Fort Sumner.

Buildings and furnishings.—The institute buildings, just completed, are of brick, trimmed with red sandstone; they are three stories, with basement, lighted by gas, heated by steam, hot and cold water on every floor, perfect fire apparatus throughout the buildings, lavatories and baths, modern water-closets, and a complete system of water works and sewerage. The grounds embrace 40 acres of level land. The furnishings, like the buildings, are new and modern; no expense has been spared to make everything thoroughly good, substantial, and comfortable. Few hotels can afford more genuine comfort. The buildings will now accommodate 200 students, with boarding facilities for 75 cadets.

Boarding students.—Under the act of 1895, "each county in the Territory may, through its county commissioners, by competitive examination, or in some other manner to be determined by such commissioners, appoint one student annually, who shall, without any charge for matriculation or tuition, receive during the year for which such student shall have been so appointed instruction in the regular courses taught in said institute." Cadets holding these appointments will pay \$190 per session for board, lodging, and laundry in the institute, but will be given free tuition. Cadets not holding appointments from county commissioners will be charged \$250 per session of thirty-nine weeks. This amount covers all expenses for board, lodging, laundry, and tuition. Books, clothing, pocket money, and personal necessities should never exceed \$50 additional. Each cadet who boards at institute should bring with him, or procure in Roswell, the following articles: Four sheets for single bed, 2 pillowcases, 1 pair blankets, 1 comfort or spread, 2 clothes bags, 6 towels, 6 napkins, 6 handkerchiefs, 6 white shirts, 6 white standing collars, 2 suits underclothing, 1 toothbrush, 1 brush and comb, 1 blacking brush and blacking, 1 napkin ring, toilet soap, 1 clothes brush.

Uniform.—All cadets will be required to wear the regulation uniform. Measures are taken in Roswell, and a good suit will cost from \$14 to \$20, including cap, coat, pants, and a vest, if desired. It is perhaps the best clothing in the world. A carefully kept suit has been known to last four years of constant wear. Payment for uniforms strictly in advance. No cadet will be allowed to make bills of any sort in town.

Instruction.—The corps of instructors consists of four teachers, all men, the superintendent, and the matron of the school. Every teacher employed holds a degree from a strong university. The course embraces the study of English, French, German, Spanish, and Latin, mathematics, and natural sciences. A business course is also given. Common sense requires for the present a thorough training school, and this feature, for some years, will be powerfully stressed. The regents are determined to make a school adapted to the needs of the Territory, yet fully abreast with the times. Solid value will be given a patron for his money.

Athletics.—A good football and baseball coach has been secured. Ample facilities will be afforded for all manly sports and exercises, such as football, baseball, and tennis. North Spring River, a few hundred yards from the buildings, affords excellent swimming and rowing. Probably no other point in the Territory offers such excellent opportunities for boat races. While much attention will be paid to such things, no one will be allowed to neglect for them his school work or military duties.

Military system.—One of the greatest educators of our country declares: "A distinctive military system tends to muscular development and physical health, by an enforced regularity of food, sleep, and exercise. It creates habits of promptitude, order, discipline, and subordination. It fosters self-reliance and force of personal character by removing all extraneous distinctions, and by casting each youth, whatever his antecedent circumstances, on his own individual responsibility. It is equal, uniform, and wholesomely restraining without rigor." This has been the verdict of history. The best teachers of the country favor it as conducing to better discipline, better work, better health, and better citizenship. In preparatory schools of every order it is in some form always desirable. In the busy West, with its imperfect system of secondary schools, it is almost indispensable in securing best results.

Military duties.—While, for the present, the enforcement of really burdensome military requirements will not be attempted, the fact must never be ignored that this is primarily a military school. There will be nothing in which a young boy may not pleasurably and profitably participate. At the same time, a regular commandant will reside in barracks and have charge of them day and night. Frequent inspections are made by the commandant in person, and the usual military discipline rigidly enforced. The school has seventy-five Springfield rifles and two pieces of ordnance.

Age of admission.—It is impossible to prescribe here any certain age of admission. The testimony of another educator, who manages the oldest school in the West, is in point: "For a good education, a good foundation is of the first importance; and boys who remain at home until they are 16 rarely have such a foundation. It is a very common mistake to send boys who are too young to be subjected to temptation to the preparatory department of some college where the pupils room about in town and enjoy at too early an age the privileges of college students. At a good training school the pupils live in the school building and are under the charge of experienced masters. In the evening they study in the schoolroom under the direction of an experienced teacher. The advantage of this system can hardly be overestimated."

The superintendent of the South's oldest training school, which has been in successful operation for one hundred and five years, declares: "For twenty-five years the ages of our pupils have varied from 11 to 25, sometimes 10 to 30. If we had our choice, we should prefer to receive

"boys from 12 to 14 years of age, who can read intelligently, write legibly, and add, subtract, multiply, and divide whole numbers—which is all the preparation needed to enter the school."

Both of these are high-grade military schools, ranked by the United States Government as the very first of their class. The testimony of the New England schools is to the same effect, and opinions of the highest character from all parts of the world justify these views.

It is the intention of the regents of the New Mexico Military Institute to give the people of the territory a sound, thorough, practical school; to provide a first-class home for boys of all ages intrusted to their care; to transact all business with simplicity, economy, impartiality, and downright honesty. The superintendent, matron, and teachers are required to live in the institute buildings with the students. All such impositions as hazing, bullying, and fighting are practically impossible. Gambling, drinking, and all other immoral acts could hardly go undiscovered and unpunished by prompt expulsion. The food and service given the students will be precisely that given the teachers and superintendent's family, and will be entirely wholesome and abundant. A physician, regularly employed, will attend to the sick, for whom an infirmary is provided.

Reports and examinations.—Reports will be sent at stated intervals to parents and guardians, showing the student's progress and conduct. Written examinations will be required at the end of each term.

Resident students.—Students not boarding at the institute will pay \$60 per session. While they are subject to the same regulations as boarding students during the day, and are equally liable to be expelled for immoral or intemperate conduct at any time during the session, no responsibility is assumed as to them when not on the institute grounds. For this cause it is highly desirable that all cadets should board at the school.

Politics and sectarianism.—The New Mexico Military Institute, built and maintained by the people, is the property of the Territory. It has nothing whatever to do with politics. Students will attend whatever church their parents desire they should, under the care of the commandant or cadet officer. No exhibition of political or sectarian bias will be tolerated by the regents.

Session of 1898-99.—The first regular session will begin September 5, 1898, and end in June, 1899, embracing three terms of thirteen weeks each.

All amounts payable one-half at entrance, one-half January 1, 1899.

NEW MEXICO COLLEGE OF AGRICULTURE AND MECHANIC ARTS,
Mesilla Park, N. Mex., August 30, 1898.

SIR:—In accordance with your request I beg leave to make the following report on the operations of the New Mexico College of Agriculture and Mechanic Arts, located at Mesilla Park, N. Mex., and the experiment station connected therewith for the year ending June 30, 1898:

The seventh session opened on September 1, 1897, and continued until May 25, 1898, on which day it closed with highly creditable commencement exercises. The session was a successful one. The total enrollment reached 215, an increase of 62 over the previous year. This increase was well distributed among the different departments of the college. The college offers four collegiate courses of four years each, viz: A course in agriculture, a course in mechanical engineering, a course in civil engineering, and a scientific course. Shorter courses in bookkeeping, stenography, and typewriting are also offered.

The college is still compelled to have a subfreshman department, in which students of limited education are prepared for the college proper, and this condition will exist until there are enough high schools in the Territory to do this work for the higher institutions. This condition is not peculiar to New Mexico. In many of the States these departments are maintained and quite a number of high-grade colleges believe

that their success in college work has been largely the result of the good preparation in their preparatory departments. Owing to the thorough training given in the lower departments the number who enter the college proper is constantly on the increase, and the requirements for admission into the freshman class have been persistently raised, until now they are higher than in most of the agricultural colleges in the neighboring States and Territories and fully equal to the average in the United States. In the faculty the leading universities and scientific schools of the country are represented, and the personnel of the professors and instructors is such as appeals to the people of the Territory for their full confidence and unqualified support.

The faculty and instructors are as follows: Cornelius T. Jordan, A. M., president and professor of political science; Clarence T. Hagerty, M. S., professor of mathematics and astronomy; Arthur Goss, M. S., A. C., professor of chemistry; George Vestal, professor of agriculture and horticulture; Frank W. Brady, M. E., professor of mechanical and civil engineering; Ida M. Jones, professor of Spanish; T. D. A. Cockerell, professor of entomology and in charge of physiology and zoology; Hiram Hadley, A. M., professor of history and pedagogy; Elmer O. Wooton, A. M., professor of botany, geology, and physics; Frederick F. Barker, LL. B., professor of English and Latin; Ralph Roy Larkin, B. S., principal of the preparatory department and in charge of subfreshman class; Frank E. Lester, instructor in stenography and typewriting, librarian, college clerk, and secretary to the faculty; R. Fred Hare, M. S., instructor in chemistry; Charles Mills, instructor in shops; Ellen F. Gibson, instructor in elocution and physical culture and assistant in the preparatory department; Joseph F. Bennett, jr., B. S., instructor in book-keeping; Fabian Garcia, B. S., assistant in agriculture and horticulture; Geraldine Combs, assistant in the preparatory department; Ida E. Freeman, assistant in the preparatory department and matron of girls' dormitory; Duval Garland Cravens, B. S., assistant in the engineering department; Katherine Doughty, assistant in the preparatory department; Humboldt Casad, assistant in agriculture and horticulture; Elizabeth Wickham, assistant librarian; Helen M. MacGregor, assistant college clerk; John D. Tinsley, biologist to the experiment station; C. H. T. Townsend, biographer and systematic entomologist; Alfred M. Holt, M. S., assistant station chemist; Charles E. Mead, B. S., superintendent San Juan branch experiment station; John S. Thornhill, superintendent Las Vegas branch experiment station.

The amount received from the United States Government, under act of Congress of August 30, 1890, for last year was \$23,000. This amount was expended in accordance with the provisions of that act, and the expenditure has been approved by the Commissioner of Education at Washington. The amount received from the Territorial fund for the year was slightly above \$5,000. This amount was used to pay for teaching Spanish, for printing catalogues, for insurance, for postage, for pay of janitors, for other incidental expenses, for building, and for such necessary expenses that could not be paid for out of the United States Government appropriation.

During the year the college has grown in the confidence of the people and has greatly increased its facilities for doing successful work. A new science hall has been completed and equipped. This building has seventeen good rooms, and in it are located the chemical, botanical, entomological, and biological laboratories. The material used in the construction of the building is of the best, and the new apparatus purchased is of the latest pattern and design. A girls' dormitory has also been built. This is a large brick building finished in natural wood, with reception room, dining room, matron's rooms, kitchen, and closets on the first floor, and large, airy, well-finished living rooms on the second floor. Good board and washing are furnished for \$15 per month. As yet the college has not been able to build a dormitory for young men, but good substantial board in private families, living near the college, can be had for \$16 to \$18 per month. A number of young men have lived in clubs and thus reduced the price of board and lodging to \$8 or \$10 per month.

The agricultural experiment station in connection with the college has had a most successful year. Very valuable experiments have been made in many lines, among which may be mentioned experiments with the codling moth, sugar-beet experiments, experiments in irrigation, and some work on plant physiology. There are two substations, one at Los Vegas and one at Aztec. The work at these substations is now in better condition than ever before.

The fund for the maintenance of the experiment station and the substations comes from the United States Government and is expended under the supervision of the Department of Agriculture.

Very respectfully,

CORNELIUS T. JORDAN, A. M.,
President and Director.

HON. MIGUEL A. OTERO,
Governor of New Mexico, Santa Fe, N. Mex.

THE REPORT OF THE NEW MEXICO SCHOOL OF MINES.

SIR: In compliance with your request, I herewith submit report of the New Mexico School of Mines for the year ending August 1, 1898, which said report, in so far as it relates to the work of education during the past year and the present conditions and future prospects of said school, has been prepared by the faculty of the institution, and is attached hereto.

I beg leave to submit also the following statement of receipts and disbursements made by me as treasurer of the board of trustees for the year ending August 1, A. D. 1898:

RECEIPTS.

Received from the Territorial treasurer on the school's share of the Territorial institution fund	\$4,080.00
Received matriculation fees from students	200.00
Laboratory: Received from students for chemicals and materials used and for assay work by the director	174.45
Total receipts	4,454.45

DISBURSEMENTS.

Building: Paid for repairs and insurance	340.00
Salaries paid to instructors and janitor	3,646.50
Incidental expenses, including meetings of the board, printing, stationery, expense of canvassing, and miscellaneous items	157.28
Equipment: Apparatus purchased	28.85
Chemicals and other material (including fuel) purchased for the use of the school	303.79
Total disbursements	4,476.42

RECAPITULATION.

August 1, 1897, cash in treasurer's hands	285.66
Total receipts	4,454.45
	4,740.11
Total disbursements for year	4,476.42
August 1, 1898, cash remaining on hand	263.69
All of which is respectfully submitted.	

JAMES G. FITCH,

Secretary and Treasurer, Board of Trustees, New Mexico School of Mines.

Hon. MIGUEL A. OTERO,
Governor of New Mexico.

SIR: We beg leave to submit to your consideration the following report concerning the New Mexico School of Mines for the last scholastic year:

Considering the difficulties with which the management of the school have had to contend, all that could be expected has been accomplished. The faculty has, because of lack of revenue, consisted of but one professor and one instructor. Though the number of preparatory students has been slightly less than last year the number of students engaged in the advanced technical work of the institution has been the same.

The financial statement, inclosed herewith, shows that there has been expended \$4,476.42, a sum less than one half that which the founders of the school thought they were providing when they fixed the rate of taxation for its maintenance at one-fifth of a mill.

The list of students in attendance at School of Mines may be tabulated as follows:

Total number of students	21
Males	18
Females	3
Preparatory	16
Technical	5
Average age	19
From Socorro	16
From abroad	5
Of Spanish-speaking parentage	5

It will be noticed that of the total number of students approximately 25 per cent have been engaged in the technical work, and that all of these are from points outside of Socorro.

During the present summer a thorough canvass of the Territory has been made for the purpose of calling attention to the advantages afforded by the school. There is now every reason to expect that the attendance at the institution for the next year will show an increase of at least 50 per cent over that of last year.

For the last three years Prof. W. H. Seamon, B. S. A., of the University of Virginia, has been employed as director of the faculty of the school. Last spring, however, he tendered his resignation, to take effect August 1. To fill the vacancy thus caused the board have secured the services of Prof. F. A. Jones, E. M., C. E., of the Missouri School of Mines. Professor Jones has a practical knowledge of mines and mining operations in New Mexico, Arizona, Mexico, and Central America. For the last three years he has been employed as United States assayer for the port of Kansas City, and has also been chief chemist on the board of geological survey for the State of Missouri. E. A. Drake, M. A., of the University of Wisconsin, an instructor of fifteen years' experience, has been principal of the preparatory department during the past year, and will continue in that capacity. Owing to the expected increase in attendance the coming year it has become necessary to employ another instructor, and the board of trustees are now taking steps to secure a competent person for this position.

The School of Mines is not receiving the financial support that its founders anticipated for it. When the establishment of the institution was provided for in 1889 the assessed valuation of the taxable property of the Territory was, approximately, \$45,000,000. Under the appropriation of one-fifth of a mill for the maintenance of the school it was expected that a revenue of about \$9,000 would be derived from this source. Instead of this expectation being realized the revenue of the institution has, owing to the depreciation in the value of property and failure to collect taxes, shrunk year by year to about one-half what was anticipated.

With a revenue adequate to its needs the School of Mines can be made one of the most important agencies in the development of the Territory. The well-being of the Territory depends largely upon the condition of its mining industry. The fact that New Mexico contains many rich and easily accessible mining regions where mining operations may be studied directly, and the further fact that New Mexico has a climate of unrivaled salubrity—these are attractions which, under proper conditions, would not only deter the youth of the Territory from going abroad for a technical knowledge of mining, but would also bring within her borders a most desirable element of population from other parts.

All of which is respectfully submitted.

F. A. JONES, *Director.*

E. A. DRAKE,
Faculty of the School of Mines.

Hon. MIGUEL A. OTERO,
Governor of New Mexico.

NEW MEXICO NORMAL SCHOOL,
Las Vegas, August 20, 1898.

SIR: Pursuant to your request, I submit herewith a report of the condition of the New Mexico Normal School, at Las Vegas, for the year ending June 30, 1898.

My last report, for the year ending June 30, 1897, after giving a history of operations since the creation of the school, showed that contracts had been let for the completion of the masonry and roof of the normal-school building for the sum of \$11,440. The funds for this purpose were realized from the proceeds of the \$10,000 of bonds authorized by the legislature of 1897, and current receipts from taxes. It was also stated that the work thus provided for would not include the finishing, furnishing, or equipping of the building.

The work so contracted for was promptly and satisfactorily done, so that the walls and roof of the building were finished, and a fair idea of its external appearance was given. It was expected that enough money might be accumulated out of taxes to finish a few rooms in the lower part of the building and open the school in a small way in the fall of 1898.

The treasurer's report for the fiscal year ending June 30, 1898, shows the following funds received and disbursed or on hand:

Statement to June 30, 1898.

RECEIPTS.

January 25, 1894, to June 30, 1896, from auditor.....	\$13,387.79
July 1, 1896, to June 30, 1897, from auditor.....	5,188.21
May 4, 1897, from the sale of bonds.....	10,000.00
October 4, 1897, from auditor.....	1,784.82
March 12, 1898, from auditor.....	2,383.06
Total.....	32,743.88

EXPENDITURES.

As per previous report, to June 30, 1897.....	\$18,697.31
For building, July 1, 1897, to June 30, 1898.....	11,484.00
Expense of negotiating bonds.....	500.00
Sundry expenses.....	45.00
	<hr/>
	30,726.31
Balance on hand June 30, 1898.....	2,017.57

Previous to the expiration of the fiscal year under consideration a patriotic movement was inaugurated among the citizens and business institutions of Las Vegas to provide the necessary funds for completing and equipping the normal-school building, so that it might open its doors to the pupils of the Territory at the beginning of the next school year. This resulted in the raising, by subscription, of a fund of \$18,475, in the form of an advance to the Territory—the subscribers receiving receipts showing that they are entitled to reimbursement pro rata out of any funds that may hereafter be provided by the Territory for that purpose. With this money at their command the board of regents was able to proceed with the completion of the building in every respect according to the original plans. After due advertisement for proposals, contracts were let to the lowest bidders, as follows:

For plastering.....	\$3,812.50
For doors, windows, and all interior finish.....	9,400.00
For steam-heating plant.....	2,650.00
For plumbing.....	590.00
For electric wiring.....	250.00
	<hr/>
	15,702.50

In addition to this there is allowed:

For sundry extra work on ventilating ducts, boiler house, etc.....	300.00
Furniture, equipment for physical, chemical, and biological laboratories, and blackboards, etc.....	2,500.00
	<hr/>
	18,502.50

At the date of this report all the work is rapidly approaching completion, and the school will open with full equipment and ample facilities in every department on the first Monday in October, 1898.

The public spirit exhibited by the people of Las Vegas and vicinity in this matter is worthy of the highest praise.

The school building is the most beautiful piece of architecture in New Mexico. It is also the most substantial and the cheapest public building, in proportion to its size and excellence, in the Territory. It is a three-story stone structure, built of the beautiful purple sandstone from the Las Vegas quarries. Above the third story is an attic containing two large and amply lighted rooms, which will be used for a museum and gymnasium. The assembly room has a seating capacity of 400, and the school has ample facilities, both as to room and equipment, for the accommodation of 400 pupils. The heating and ventilating arrangements are according to the most improved modern standards. The school is located on a commanding site, with perfect drainage. It is in the heart of the city, so that the city public schools are available for the purpose of model and training schools. An arrangement has been made with the board of education of East Las Vegas by which certain grades of the city schools are to be taught in rooms of the normal school, available for that purpose, as model schools. The high-school grades are to be merged in the academic course of the normal school. For these advantages the city board of education pays to the normal school a certain percentage of its revenue, which is sufficient to enable the latter to make a very material increase in its faculty.

The board has engaged as president of the faculty Prof. Edgar L. Hewett, heretofore principal of the training department of the Colorado State Normal School at Greeley. We believe the Territory is fortunate in securing his services, which were most reluctantly dispensed with by the institution with which he was connected. The Colorado normal school ranks as one of the best in the United States, and Professor Hewett's indorsements from its authorities, as well as from other prominent educators, are of the highest possible character. With four other professors, selected from among graduates of such great institutions as Leland Stanford and the Chicago University, the board feel confident that it will open the school with an exceptionally strong faculty, and with every promise of usefulness to the people of the Territory.

The course of instruction will embrace two main departments: The normal, whose aim will be to educate and train teachers for the public schools of the Territory, and the academic, which will afford a thorough general education to equip pupils for the duties of life, and also to admit those who desire it to the higher universities.

Respectfully submitted.

FRANK SPRINGER,
President of the Board of Regents.

Hon. MIGUEL A. OTERO,
Governor of New Mexico, Santa Fe, N. Mex.

SCHOOLS IN LAS VEGAS.

Buildings.—In the city of Las Vegas is located one of the Territorial normal schools. This structure, built of native red sandstone, will when completed be the most imposing building in the Territory. The aggregated cost of the building, which is now three stories high and ready for the roof, when completed, is \$40,000. It is expected that the building, or a part of it at least, will be ready for occupancy by September 1, 1898.

On the west side are two stone buildings, each two stories high, well adapted for school purposes; on the east side are three buildings two stories high, one the public school building of four rooms, another the academy building of four rooms, and the third the central or city building, four rooms of which are used for school purposes.

Schools.—On the west side are three public schools, two private schools, and three church schools. On the east side are ten public schools and the high school.

The west side is not included in the city corporation, therefore I have to do only with the east side public schools.

Board of education.—M. W. Browne, president; C. V. Hedgecock, vice-president; J. A. Carruth, J. M. D. Howard, George V. Reed, R. B. Rice, N. B. Stonerod, Mr. Harmon, W. C. Reid, secretary; C. E. Perry, treasurer.

Teachers for 1897-98, central building: Miss Maggie Bucher, principal of high school; Miss Flora Beschle, eighth grade; Miss May Howard, part of fifth and sixth grades.

Teachers for 1897-98, academy building: Miss Lucy Stone, principal, seventh grade; Miss Laura Davenport, sixth grade; Miss Alice Blake, fifth grade; Mrs. Sallie Douglas, fourth grade.

Teachers for 1897-98, public school building: Mrs. Mattie Garlick, principal, third grade; Miss Belle Rogers, second grade; Miss Ella Stonerod, first grade, A division; Miss Minnie Holzman, first grade, B and C divisions.

Statistics for the school year 1896-97.

School census of East Las Vegas	727
Number of months school was in session	9
Number of pupils enrolled in school	610
Average daily belonging in school	497.9
Average daily attendance at school	474.6
Per cent of attendance on belonging	95.3
Number of cases of tardiness during the year	572

REPORT OF THE NORMAL SCHOOL OF NEW MEXICO, AT SILVER CITY.

The normal school of New Mexico, located at Silver City, has completed the fourth year of its existence. The school was established by the Territorial legislature of 1893 and was opened for the admission of pupils the following year. Steps were immediately inaugurated for the erection of a building commensurate with the wants and needs of the school. Since that time a three-story building of nine rooms has been erected and equipped with many of the modern conveniences known to first-class school architecture. A more costly building might have been erected by deferring the opening of the school for several years, but the board of regents proceeded upon a different theory. They considered the demand for such a school was urgent, and the sooner they established it to satisfy these demands the better they would be serving the people of the Territory. Besides, they had faith enough in the Territorial legislature to believe that as the school increased in numbers and efficiency ample provisions would be made when the time should come for its accommodation. The present structure, however, serves the purposes of the students and the departments of the normal proper quite well.

The school furniture is not costly, but neat, serviceable, and of the latest style. Much care has been exercised in its choice and arrangement. The assembly room is seated with opera chairs with folding arm attachments. The other rooms are furnished with desks, chairs, and work tables of various descriptions. Everything about the building is kept clean and in good repair, "as good as new," under the impression that such things are important elements in training during the formative period of the student.

The apparatus of the school at this early period of its existence is not extensive, of course. Only such purchases have been made as were the most needed. To supply the deficiency in this line students, by the assistance of the teachers, have largely constructed their own working material. While the use of such material may not give the most accurate results, yet the student has a much more profitable experience, and he will doubtless appreciate more fully the more delicately constructed instruments of the scientist. It is the design of the management of the school, however, to use both the scientific and unscientific apparatus in actual work, the better class being added as rapidly as the funds will permit.

Within the last two years the school has come in possession of a fine cabinet. The collections have been made wholly by the students, teachers, and friends of the institution, and represent quite fairly the geological and mineral wealth of this section. In point of variety it perhaps excels any similar collection in the Territory. The next movements in this direction will be made along the lines of zoology, botany, and ethnology.

Within two years the library has grown from two or three volumes to more than 2,000 volumes. The number and quality of books in the pedagogical department is especially strong. The school has become one of the remainder depositories for the Government publications. A certain sum of money is set apart yearly for subscriptions to current publications and to purchase new books.

The purpose of the school is the same as all normals, namely, to prepare teachers for the Commonwealth that created it. To carry out this purpose it seeks to do three things: (1) To give the student a thorough knowledge of the branches required to be taught in the common

schools of the Territory; (2) a knowledge of pedagogy which deals with the art and science of teaching; (3) practical training, consisting of observation of good teaching, illustrative teaching, and practice teaching.

Students who desire to enter upon the teachers' profession are offered both an elementary and an advanced course. The former prepares them to teach in the elementary schools and high schools in the Territory, the latter for still higher work. Pupils are permitted to pursue academic studies only, if they so elect, but so far all the graduates of the school are from the professional department. No teaching pledge is required, for the reason that it often gives the pupil and parents a wrong attitude toward the school. It very frequently occurs that students enter the professional classes having no desire to teach, but become so attached to the work that they graduate with honors and join the teaching force of the community.

There has been a steady increase in the enrollment and average daily attendance from the beginning. This year, 1897-98, it reached the number 72. Including the year just passed 20 persons have been graduated. Sixteen of these are engaged in teaching.

The scholastic year consists of forty weeks, which is divided into terms of twenty weeks each. A summer term of four weeks was added this year as an experiment and proved reasonably satisfactory. Forty-seven were enrolled, and considerable interest was manifested.

The future prospects of the school are bright. It is growing in popularity and general good will among the people of the Territory. The increasing attendance calls for the organization of new and separate departments and a larger corps of instructors. The time has come when more teachers must be added to do the most effective work. This will necessitate a larger appropriation of funds, but we have no doubt that the next legislative assembly will generously sustain the school.

NEW MEXICO SCHOOL FOR THE DEAF AND THE BLIND,
Santa Fe, N. Mex., August 20, 1898.

DEAR SIR: I am in receipt of your favor of the 18th ultimo, asking for a report on the condition of the school for the deaf and the blind under my charge, for the Territory, and will reply that there is absolutely nothing that has been executed by the Territory in behalf of the school for the past year and half, for lack of available and sufficient financial means. Of course there are many afflicted children of this Territory who are still clamoring and demanding the government of the Territory to treat them well and equitably in the matter of education. The main aim of the school is and should be to give them a good, common-school, English education, with the ability to read, write, and cipher, and with a knowledge of good morals and gentle manners. It is the only one thing that not only instructs them in better paths of living and improves their positions in society and citizenship, but encourages them to follow what will make men and women of them, and give them worthy purposes in their future life. The financial condition of the school has never been satisfactory nor sound; hence it has been an inevitable hindrance to the progress and management of the usual affairs of the school. It is expected that the school will reopen late in this coming autumn and be in full operation at its next term. I am still in hopes that the next legislature of the Territory will act and decide upon something to better equip and aid the school in a right and liberal manner.

The meeting of the International Association of the Instructors of the Blind occurred at the Michigan school for the blind in July last and continued in its session three full days. The attendance at the above convention was over fifty delegates, representing most of the various public schools for the blind in North America. Its worthy papers and discussions were all directed to the educational and industrial work for the blind. I was cordially invited and treated as a guest of that school, and represented this school in the convention. I have received new inspiration and fresh experiences for my better help and encouragement in this work for the blind of the Territory.

The fifteenth convention of the instructors of the American schools for the deaf was held at the Ohio school for the deaf, and continued in its daily session for a week. Its attendance was very good, comprising about three hundred and fifty

principals and instructors from most of the different schools for the deaf, with five teachers of the deaf from Great Britain. Excellent papers and discussions on various subjects in regard to all methods of instructing the deaf, as now employed in line of intellectual, industrial, and physical education pursued in the schools for the deaf in America, were of worthy interest and value. It has been fourscore years since the first school for the deaf was founded at Hartford, Conn., and excellent results, wonderful changes, and rapid advancements have taken place in the education of the deaf.

During the last scholastic year I still managed and instructed a school as a private enterprise for five mute Indian children and four white deaf pupils, at their own expense for their schooling.

My real hope is that increased means, decent facilities, and good encouragement will be given the school to promote the interests of afflicted uneducated children, who are generally considered as a menace to the community in which they reside and can not be benefited by instruction in ordinary schools on account of their misfortunes; and that the affairs of the school being designed especially for their benefit will be conducted with greater vigor, better efficiency, and stronger economy to educate, elevate, and civilize them. The Territory should accede to their wants to be educated, and push forward and raise by its efforts and liberality the cause of this education to a higher standard to render the school a good success, and make it one of the most beneficial, progressive, and honored public institutions of the Territory. From the view of the above statement it is seen that "He hath done all things well: He maketh both the deaf to hear and the dumb to speak," and the blind to see in the light of wisdom.

Trusting, my dear governor, that you will endeavor in all things to see a way clear and just to foster, encourage, and provide for all that is needed for the full maintenance of the school, and to promote all the interests of the cause of this education for afflicted children of the Territory to fit themselves in this sphere for which they were intended by the holy Creator, this report is respectfully submitted.

LARS M. LARSON,

Principal New Mexico School for the Deaf and the Blind.

Hon. M. A. OTERO,

Governor of New Mexico, Santa Fe, N. Mex.

Annual report of the New Mexico Children's Home, Albuquerque, N. Mex.

Number of children in the home.....	12
Number adopted from home	4
Number returned to father	4

EXPENDITURES FOR THE YEAR.

Provisions	\$628.93
Care of the children.....	310.00
House rent.....	240.00
Fuel.....	50.00
Merchandise	250.64
Incidentals	24.85

Total..... 1,504.42

This home for children is incorporated under the laws of the Territory of New Mexico, and it is doing a noble work.

The directors are as follows: Mesdames M. J. Borden, A. L. Chandler, W. S. Lowe, W. C. Hadley, Louis Ilfeld, William Farr, A. G. Wells.

The officers are Mesdames J. W. Granger, president; L. E. Parshall, vice-president; L. W. Roberts, secretary; J. M. Moore, treasurer.

ST. VINCENT'S HOSPITAL.

The Sisters of St. Vincent maintain an excellent hospital in the city of Santa Fe, where the rich and poor are treated alike. In connection with the hospital, these noble Sisters are doing a grand work in the orphanage.

Following is a report of St. Vincent's Hospital for the fiscal year ending March 6, 1898:

Number of patients in hospital March 1, 1897.....	36
Number of patients received during the year.....	70
Number of patients discharged during the year.....	68
Number of patients died during the year.....	18
Total number of days.....	6,607
Number of prescriptions filled.....	459
Number of patients remaining in hospital March 6, 1898.....	20
Number of cases treated during the year.....	106

Financial statement.

RECEIPTS.

From Territorial appropriation.....	\$2,639.77
From the sanitarium.....	298.16
Balance due from the Territory for forty-eighth fiscal year.....	1,860.23
Total.....	4,298.16

DISBURSEMENTS.

Groceries.....	\$1,758.47
Meat.....	849.13
Feed for cows.....	234.08
Tea and coffee.....	84.00
Drugs.....	200.61
Water.....	120.00
Bread.....	343.24
Coal oil.....	78.75
Coal and freight.....	328.27
Butter.....	226.61
Pauper burials.....	75.00
Total.....	4,298.16

INDIANS.

NAVAJO AGENCY,
Fort Defiance, Ariz., September 6, 1898.

SIR: In compliance with your request of the 29th ultimo, I take pleasure in furnishing you with such statistics relating to the Navajo Indians as I have been able to get. The wide extent of the Navajo country and the scattered manner in which these Indians live make it impossible to obtain accurate statistics with the very limited force of employes under me, who have, moreover, other matters of importance which keep them fully occupied.

I regret that I am unable to give you fuller and more exact information.

Very respectfully,

CONSTANT WILLIAMS,
Major, Seventeenth Infantry, Acting Agent.

His Excellency the GOVERNOR OF NEW MEXICO,
Santa Fe, N. Mex.

Population, 20,500 (estimated).

Number who wear citizen's clothing in part, 1,000 (estimated).

Number who can read, 250 (estimated).

Number who can use English enough for ordinary intercourse, 500 (estimated).

Number of children of school age (between 6 and 18), 4,000 (estimated).

Number, kind, and value of dwelling houses for Indians built during the year, 75; stone; \$150.

Cost of each to Government, about \$9 for doors and windows.

Proportion of Indians who obtain subsistence for themselves or others in civilized pursuits, all.

Government rations or annuities issued, none.

Number of missionaries, two males, three females.

Number of Indians who are church members, none.
 Number of formal marriages solemnized by clergymen or magistrates during the year, none.
 Number of divorces granted by courts during the year, none.
 No data as to births and deaths.
 Number of Indians killed during the year, 2 (by Indians).
 Number of whites killed by Indians during the year, none.
 Number of Indian criminals punished during the year, by agent, 15; by civil authorities, 2.
 No data as to number of acres cultivated or of crops raised during the year.
 Amount earned by Indians during the year in freighting for Government, \$1,421.44.
 Value of Indian products sold to Government during the year, \$4,807.84.
 No data as to freighting and other labor performed for private individuals.
 No data as to Indian products sold to private persons.
 Number of sheep owned by Indians, 800,000 (estimated).
 No data as to other stock.
 Number of Government schools, 2; capacity, 150.
 Average attendance of pupils during the year, 180.

CONSTANT WILLIAMS,
Major, Seventeenth Infantry, Acting Agent.

PUEBLO AND JICARILLA AGENCY,
Santa Fe, N. Mex., August 11, 1898.

SIR: In compliance with instructions from the Office of Indian Affairs dated June 1, 1898, I have the honor to submit the following report of the Pueblo and Jicarilla Agency for the year ending June 30, 1898:

Having taken charge of this agency July 1, 1898, I can do no more than make a résumé of affairs as they appear from the records of the office. During the year three different persons have acted as agent, and, accordingly, affairs are decidedly mixed.

The agency office is situated at Santa Fe, with the subagency over the Jicarilla Apache Indians at Dulce, N. Mex., 216 miles distant.

PUEBLOS.

Population.—A census was taken a few days before the close of the year as accurately as the exigencies permitted. From this it appears that in the eighteen pueblos there are 9,494. Of these 2,475 are males above 18 years of age, 2,648 are females above 14 years of age, and 1,897 are school children between the ages of 6 and 16 years, of which number 641 are attending or have attended some school, while 1,256 are not attending any school. These figures can only be considered approximate. In only five pueblos was it found possible to take a complete census, in seven others a tolerably reliable estimate was obtained, while in six of the smaller pueblos no data whatever could be obtained, as there is no employe of this office in the vicinity. Heretofore there have been nineteen pueblos, but during the past few years the Pojuaque Indians have gradually deserted their pueblo and joined their people, about twenty in number, with the pueblo of Nambe, until now the Pojuaque pueblo has become extinct. This was a wise movement, in my opinion, as the people were not strong enough to accomplish much good or to sustain a pueblo government.

Industries.—The pueblos are a practically self-supporting people, farming many thousand acres of land, raising large herds of horses, burros, sheep, and goats. Many of the people live in comfortable, well-built, and attractive adobe houses, surrounded by well-kept orchards. All the lands have to be irrigated and much time and labor is spent caring for the ditches. One of these canals, built by the San Felipe Indians, is 10 miles long and in many places 20 feet deep and 15 feet wide. This canal was constructed by the Indians with no other implements than shovels, spades, and picks. Some of the pueblos—Taos, for example—not only raise sufficient wheat and oats for themselves, but also supply the whites of the surrounding towns. If these people could be furnished a few practical farmers to instruct them, they would soon become well-to-do citizens and a help to the Government under which they live instead of a burden.

Threshing.—The method of threshing among the pueblos especially calls for aid and assistance. The wheat and other grain is placed on the ground and the cows, horses, burros, goats, etc., are driven around over it until the grain is tramped out. Of course it is mixed with the excrement of all these animals, and untold labor is required in cleaning the grain, which is accomplished by picking foreign substances out with the fingers, throwing it up from baskets, that the breeze may blow away

the chaff, and washing it repeatedly in the water of a near-by ditch. To aid them in advancing beyond these primitive plans, I recommend that a fanning mill be furnished each pueblo. These mills, I am sure, will help them to clean their grain quickly and in such a manner as to render it salable in the surrounding markets. With the present method these people get only about half price for their grain, which is much damaged by tramping, washing, and being improperly cleaned. These fanning mills will encourage them to raise larger crops, and, as they will get double prices, the farming instinct will be greatly fostered.

Schools.—There are fourteen day schools under this agency and one contract boarding school situated at Bernalillo. The latter is in good condition and well kept. The day schools are, as a rule, in a most lamentable condition, owing to the fact that they have been, in my opinion, much neglected, and because they are conducted in buildings rented from the Indians themselves, some of them without floors and with absolutely no ventilation, without sufficient water, and dependent upon the school children for fuel. Very few of these schools have anything but wooden benches placed around the wall. In two cases—San Felipe and Santo Domingo—the Indians refuse to send any girls to either the day schools or the nonreservation boarding schools at Albuquerque and Santa Fe. The inhabitants of San Felipe have agreed to send all their girls to the day school, provided a noonday lunch and a housekeeper are furnished, but as yet I have been unable to obtain authority for the same.

It is a lamentable fact that these pueblos do not wish to send their children to school. In only one village, that of Zia, do all the children attend. At Acoma the average attendance of the scholastic population is but a little over 3 per cent. If this is not a deplorable condition for a people, and one which calls for redress and reform, I do not know what bad conditions are. At Zuni there is a scholastic population of nearly 300 and an average attendance of only 40. This pueblo alone could support a school as large as Chillico, and if the children of all the pueblos could be in schools four Chillicos or two Carlises could be supported.

Compulsory education.—The poor attendance of the children of this agency illustrates in the strongest possible manner the great need of a compulsory school law. Taking the entire agency, the attendance, compared with the scholastic population, is the alarming figure of less than 16 per cent. These people are said to be citizens. If they are they should be subject to the compulsory laws of New Mexico. If they are not citizens, a law of Congress or an order from the Interior Department should place every child of proper age in school. Why should this grand and glorious nation become a laughing stock by establishing a school for these people and having a few ignorant Indians defeat its plans and policies through superstition and a kind of Chinese unprogressiveness to such an extent that only 3 per cent of the scholastic population attends the school? A compulsory law would be very easy to enforce, for one of the pueblo characteristics is to be obedient, and such a law has only to be passed and explained to them to be obeyed. I earnestly urge this matter to the early consideration of the Indian Office.

The condition of the various schools may be summed up as follows:

Acoma.—The school building is of stone and a substantial one. It is rented from the Catholic Church, though the Indians say the building belongs to them and the rent should be paid to them. This building should be purchased. There is no water, except such as is obtained from ditch, and no outhouses for the comfort and privacy of either teacher or pupils. Present enrollment, 17; average attendance, 6.7; expected increase, 400 per cent; scholastic population, 200.

Cochiti.—This school is conducted in a rented building which is inadequate in every respect. No wood is furnished except by the children, who bring one stick each, and consequently half the time there is no fire. A new schoolhouse should be built immediately. Present enrollment, 32; average attendance, 12.25; probable increase, 40 per cent; scholastic population, 93.

Isleta.—The school here is in a rented building and no seats, excepting some old benches of antediluvian pattern, which are ready to fall down. The building adjoins the graveyard where smallpox victims and others have been buried on top of each other for hundreds of years, bones and decayed animal matter being thrown up with each new grave. This place is in the center of the smallpox region, and there are few months when the disease is not prevalent. I beg that I may be allowed to relieve this unsanitary condition. Present enrollment, 29; average attendance, 16.30; probable increase, 35 per cent; scholastic population, 122.

Jemez.—School is conducted in a building rented from the Presbyterian Board of Home Missions. This building is in good condition and should be purchased by the Government. Present enrollment, 61; average attendance, 26.5; probable increase, 20 per cent; scholastic population, 131.

Laguna.—Building was built by Presbyterian Board of Home Missions and turned over to the Indians. The Government pays no rent. Twenty acres of land is reserved by the Government for school purposes, and a new and adequate building

should be erected at once. The water for school and pueblo is carried from railroad station by agreement with the company, and piping should be laid to convey water to school and village. Present enrollment, 34; average attendance, 15.7; probable increase, 50 per cent; scholastic population, 84.

Pahnate.—This school is located at one of the outlying villages of the Laguna pueblo, and the building, rented from the governor of Laguna, is in fair repair, but too small. A new building should be erected with a capacity of 50. Present enrollment, 33; average attendance, 12.8; probable increase, 25 per cent; scholastic population, 125.

Santa Clara.—School conducted in a totally inadequate building rented from an Indian. It is very small, low ceiling, without any equipment except desks. A new building should be erected here. Present enrollment, 33; average attendance, 14.36; probable increase, 25 per cent; scholastic population, 74.

San Felipe.—School in rented building belonging to Indians. It has no floor, poor ventilation, and ditch water. New building needed here. Present enrollment, 42; average attendance, 17.6; probable increase, 50 per cent; scholastic population, 96.

San Juan.—School building part of church and rented from the vicar-general. Poor equipment; new building needed. Present enrollment, 30; average attendance, 18.9; probable increase, 30 per cent; scholastic population, 85.

Santo Domingo.—Schoolhouse is rented from the vicar-general, but the ownership is disputed. Present enrollment, 51; average attendance, 14.26; probable increase, 75 per cent; scholastic population, 228.

San Ildefonso.—School conducted in building rented from Indian governor. It is in poor condition, one room being without floor. A new building is indispensable to the good conduct of the school. Present enrollment, 28; average attendance, 17½; probable increase, 20 per cent; scholastic population, 44.

Taos.—School building is rented from the priest at Taos. There are no desks, but rickety benches. The roof leaks and the doors and windows are not well fitted, which renders the building cold in winter. School has depended on the children bringing one stick of wood apiece each morning for fuel. Part of the time there is no fire. A new school building is indispensable. Present enrollment, 57; average attendance, 25.25; probable increase, 25 per cent; scholastic population, 78.

Zia.—School is conducted in a building rented from an Indian. It is in a most lamentable condition, without any ventilation whatever, narrow dirt floor, poor light, and altogether it is absolutely not fit for a stable. A new building should be built at once. The water is taken from the river and is so alkaline as to be actually poisonous. The attendance, however, is the best of any of the schools, every child except one being in school. The Department should see that better quarters are provided at once.

Zuni semiboarding school.—This is the only school plant in the agency owned by the Government. The buildings were purchased from the Presbyterian Board of Home Missions, and are sadly in need of repairs and improvements. The sewerage is very poor, endangering the health of pupils and employes. Estimates of repairs and contemplated improvements have been sent to the Office of Indian Affairs under date of March 17 and July 23, 1898. Present enrollment, 72; average attendance, 40.1; probable increase, 100 per cent; scholastic population, 295.

Following is a list of the day schools, with their respective teachers, who receive a salary of \$72 per month each:

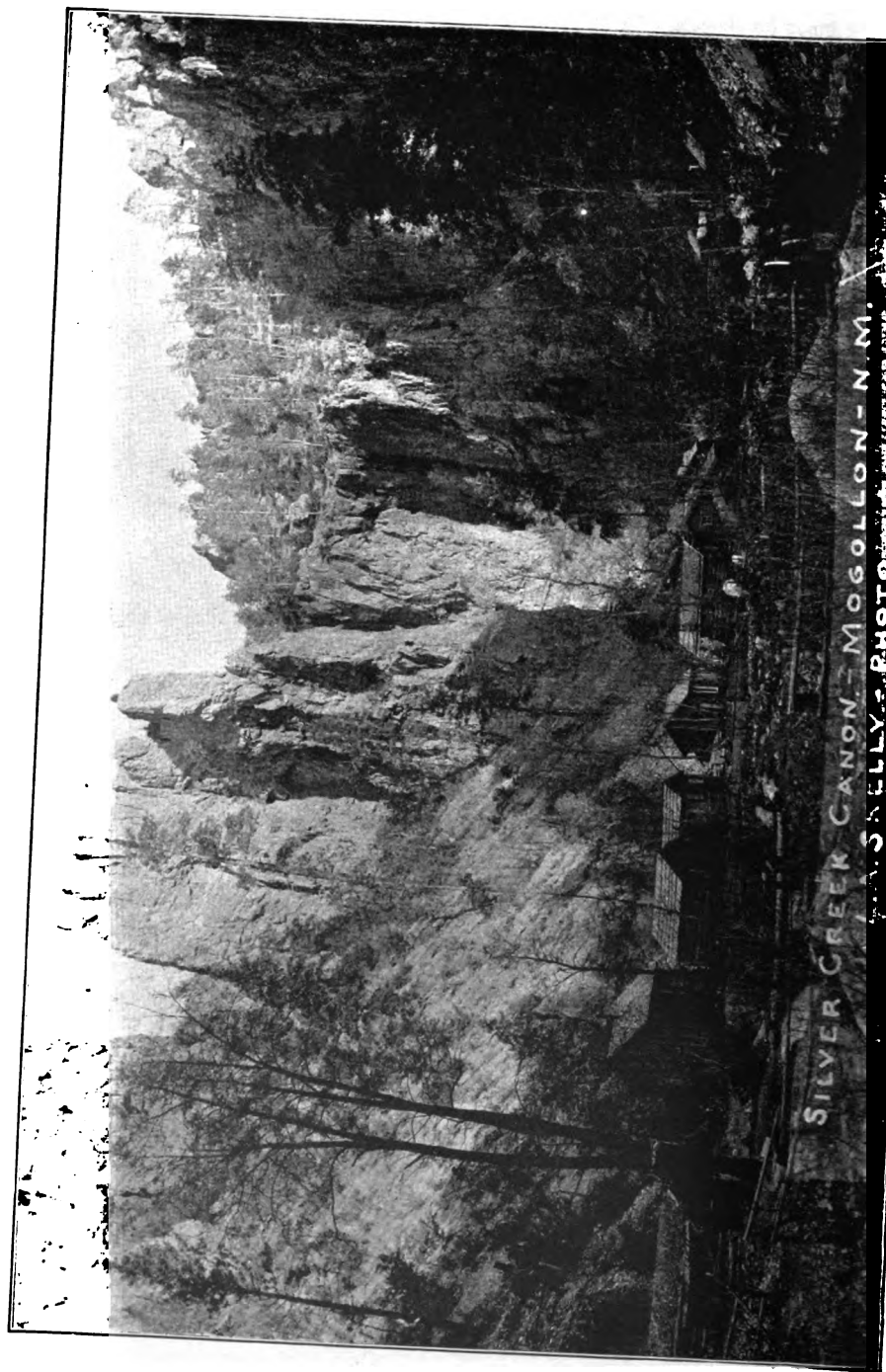
Acoma, Miss Cora A. Taylor; Cochiti, Mrs. J. B. Grozier; Isleta, Mr. James Hovey; Jemez, Miss Emma Dawson; Laguna, Mrs. Annie M. Sayre; Pahnate, Miss Annie M. Nichols; Santa Clara, Mr. William P. Taber; San Felipe, Mr. W. C. B. Biddle; San Juan, Mr. Felipe Valdes; Santo Domingo, Mr. W. S. Holsinger; San Ildefonso, Mr. Thomas Dozier; Taos, Mrs. Alice G. Dwire; Zia, Miss Caroline E. Hosmer.

Zuni semiboarding school, Miss Elmira R. Greason, principal teacher; Miss Ethel E. Gregg, assistant teacher; Miss Fannie J. Dennis, matron; Miss Ella P. Dennie, assistant matron.

In April a supervising teacher was authorized by the Department, and Mr. Charles E. Burton, of California, was appointed, at a salary of \$840 per annum.

New schools.—A new school has been authorized for the pueblo of Nambe. I shall recommend new schools at the pueblos of Sandia, Santa Ana, Picuris, and Tesuque, to be started about October 1, 1898. Also, the subagency for the Jicarilla Apache Indians should have a boarding school with a capacity of 300 pupils; but the details will come more properly under the report on said subagency.

I have recommended that the Government procure or build proper schoolhouses, because rented buildings are unsatisfactory and hard to keep in proper repair. A Government building and grounds can be beautified and rendered homelike, which is impracticable in a rented one. The schoolhouse and teacher's residence should be a pattern for implanting higher ideals in the minds of the Indians, which is not the case where it is a building which was originally intended for an Indian's dwelling, and is exactly like the houses in which the pupils live.



SILVER CREEK CANYON - MOGOLLON - N. M.
S. KELLY - PHOTOGRAPH

Housekeeper and noonday lunches.—I am sure that the experiment of furnishing a noonday lunch for the children, which has been an experiment at the San Ildefonso school, has proven a success. It is a significant fact that at this school there was a steady increase in average attendance during the months of April, May, and June, the largest average attendance of the year being in the latter month, while at all of the schools where no lunch was furnished there was a steady decrease in the average attendance during these months. This decrease is easily explained, as the children were needed at home to help in the culture of the ground and other duties, it being the busy season.

With a housekeeper in the school the girls may be taught the simpler methods of good cooking, the care of the dining room, and good housekeeping in general. At all these schools and pueblos the teacher should devote a portion of each day or week to instructing the adult Indians in industrial pursuits. While these Indians have made great progress and are self-supporting and civilized in a fashion, yet they are not self-supporting in an enlightened way, but, like Topsey, "just grow" or exist without the aid of the Government. In order that they may be taught to discard the blanket and the moccasins and the leggings and other paraphernalia of savagery, I think a housekeeper at least should be furnished each school, so that the girls and women may be helped, and the older or adult Indians taught to farm, raise stock, and build comfortable houses, etc., by giving the teacher time to get out among them and teach them the language and civilized pursuits.

Arts, trades, etc.—The only arts that I know anything of among these Indians are blanket weaving, basket making, and pottery making. The Zunis are especially apt in weaving, and some blankets are woven so skillfully that they are waterproof, and are so beautiful and of such excellent texture that they are sold for as much as \$150 for a single blanket. The pottery ware of the Lagunas and the Santa Claras is of excellent workmanship.

Some of the Indians are skilful mechanics and are sought after as laborers on the railroads to the exclusion of the Mexicans.

The greatest industry, however, and the one that will civilize them quickest, is farming, stock raising, and horticulture. When any savage people can be made to love their homes, and to be interested in improving and beautifying them, there is some hope. If these Pueblos could have encouragement and assistance along these lines, they would soon be an intelligent and progressive people.

Returned students.—This is one of the most perplexing subjects of all. While a great percentage of the returned Carlisle and Santa Fe and Albuquerque students turn out well and make fairly good citizens, yet if we admit them all to make good citizens, even then the whole number of such students, compared with the whole number of Indians steeped in superstition and ignorance and unprogressiveness, is so small that the good is swallowed up in the bad, like a barrel of fresh water tipped over into the Atlantic. While Carlisle and Haskell and Chilocco and Phoenix are educating 1,000 children 5,000 new ones are born in the Indian villages. The lesson is surely a plain one. The Government must educate a great many of the Indians so that the educated influence will overbalance the uneducated, or give up in despair. As long as there are Indian villages of uneducated and unprogressive people, just that long will there be myriads of Indian children to take off and educate and turn back into the slough of despond. Put farmers and housekeepers and matrons and compulsory education in the Indian homes and such conditions can not possibly exist many years. Then when the returned students do try to make men and women of themselves the home influence will help them on their way instead of tending to drag them down, as it undeniably does at the present time.

Missionaries.—Missionaries are supported at Zuni, Mr. and Mrs. Vanderwagen; a medical missionary at Laguna, Dr. C. E. Lukens, and two teachers at Seama, who conduct a very successful school. These missionaries, who are supported by religious societies, are doing a very good work along religious and industrial lines, and deserve the consideration of the Indian Office.

Physicians for the Indians.—These Pueblos may be said to be suffering from some form of epidemic almost constantly, any disease which is once introduced among them seeming to run through the entire tribe before subsiding.

From the amount of medicine furnished by this agency to the teachers of the various day schools I am led to believe that the Indians are gradually being brought to appreciate the fact that "white man's medicine" is superior to the "witches' caldron" of their own "medicine man," which, in serious cases, of course, often kills than cures, and it seems to me that this tendency should be encouraged by establishing among them a certain number of physicians supplied with the necessary medicines to intelligently treat the ills which they are heir to.

The last expression is used advisedly, it being an undoubted fact that every pueblo contains cases of syphilis in some of its numerous forms, the death rate among them being due probably in a greater percentage to syphilitic consumption than to any other two, perhaps three, causes combined. In parenthesis it may be

remarked that were it not for the deaths due to consumption and the great number of cases of incipient life strangled before breath, the Indians, as a race, would increase much more rapidly than they are now decreasing.

Aside from these considerations for their welfare, which every human breast must entertain, it is indubitably a fact that when a physician has been established in an Indian tribe his success in treating the people thereof has tended in a great measure to lessen the influence of the "medicine man," and just in proportion as this feeling of reliance on these quacks subsides does the advance toward civilization make strides.

Every consideration, therefore, pointing not only to the necessity but the expediency of their employment, I have the honor to recommend that five physicians be appointed for these various pueblos, which should be divided into five districts, as follows: The pueblo of Zuni, containing 1,796 inhabitants, to be the first district and to have a resident physician; the pueblos of Acoma, Isleta, and Laguna, containing about 3,000 inhabitants, to compose the second district, with a physician resident at Laguna; the pueblos of Cochiti, Jemez, Santa Ana, Santo Domingo, Sandia, San Felipe, and Zida, containing 2,852 inhabitants, the third district, the physician to reside at Bernalillo; the pueblos of Taos and Picuris, containing 570 inhabitants, the fourth district, the physician to reside at Taos City, 3 miles from Taos pueblo; the Pueblos of Santa Clara, San Ildefonso, San Juan, Nambe, and Tesuque, containing 1,194 inhabitants, to be the fifth district, the physician to reside at Santa Fe or Espanola.

These pueblos have been grouped with reference to their proximity to one another rather than to their number of inhabitants.

JICARILLAS.

This subagency is at Dulce, N. Mex., 216 miles distant from agent's office at Santa Fe. The Indians here receive rations at stated periods. While they do some agricultural work, it is not to much advantage. They raise considerable hay, corn, wheat, oats, barley, rye, potatoes, onions, and beans. Six hundred tons of hay were harvested last year, and I recommend that this industry be encouraged. In order that they may be able to sell it at remunerative prices, hay presses should be provided them and the Government should purchase hay from them to feed the agency stock.

Allotments.—The lands of this subagency have been allotted to 845 Indians; but when the allotment papers were returned only about 120 could be delivered, owing to the confusion of names or the neglect of the allotting officers. Therefore the anomalous condition prevails of an entire tribe receiving allotments and only 14 per cent of the homes delivered, the other 86 per cent being filed away in the office of the clerk in charge.

Condition of Indians and reservation.—These Indians are furnished rations to about one-third the amount necessary for their support. Their reservation is a mountainous region, wholly unfit for agriculture, unless some means of irrigation is provided. Under present conditions they can never become self-supporting, as they have no resources from which to live. Unless some means can be devised by which they will be enabled to help themselves, their rations should be increased. There is a lake 22 miles distant which might be utilized for irrigating purposes, which would enable them to pursue agriculture profitably and in time become self-supporting.

Missionaries.—Two estimable ladies of the Methodist Church, and supported thereby, are doing a good work here, holding weekly religious services and encouraging morality in every way possible.

Roads and bridges.—Ten days' work by each able-bodied Indian have put the roads in good condition. Fourteen miles of new road have been constructed and twelve miles of old road repaired. Fifteen bridges have been built.

Arts and trades.—Basket making, bow and arrow making, and beadwork are the special features of these people, and their work is of excellent quality.

Indian courts.—An Indian court is maintained, composed of three judges. During the year 72 Indians have been jailed for drunkenness and 13 have been punished for various crimes and misdemeanors. Two have been punished by the Territorial courts for housebreaking and cattle stealing. Some plan should be used to break up the whisky selling, which is carried on to an alarming extent. These Indians are allowed to go to neighboring towns to trade, and while there they get all the whisky they can pay for. In my opinion, a trader should be placed on the reservation to supply them with everything they need, and the Indians should not be allowed to go off the reservation without the consent of the clerk in charge.

Education.—These poor people have no educational advantages whatever. They have petitioned this office time and again for a boarding school, and it is only justice that they be given school facilities. This boarding school at the Jicarilla subagency I consider the most pressing need of this agency. There are 242 children of

school age, and the Indians are very anxious for the school. They have promised to send every child to the school and support it faithfully, and I believe they will do so. A school with a capacity of 300 can be supported there, and I most earnestly recommend its establishment at the earliest date possible. I consider \$30,000 a conservative estimate for the entire plant. About two years ago 160 acres of land was purchased for the establishment of a school, but the matter was allowed to drop. A large two story adobe building of eight or ten rooms is situated on the land, and this can be utilized for one of the buildings. This land is within one-half mile of the railroad station of Dulce, N. Mex., where the agency is located. As these Indians are anxious for school facilities and have been peaceable and contented, I think steps should be taken at once to establish the school. The greatest drawback to the schools of this agency is that the Indians refuse to send their children. Now that they are in the right frame of mind, they should be assisted. The Indians at this sub-agency are furnished regular rations and annuity issues, so that the Government will have a very potent means of persuading them to keep their promises in case they show a disposition to evade them. Another advantage here is that the children all live close and no expense for transportation would be required.

Conclusion.—In conclusion I desire to say that while the affairs of this agency, and especially the schools, seem to be in a chaotic condition, no efforts will be spared by this office to remedy them as far as it is possible, with the support of the Office of Indian Affairs to do so. The supervising teacher, Mr. Charles E. Burton, is giving his entire time and attention to the work of improving the condition of the schools, and if he has the proper support of the Indian Office, which I do not in the least doubt, I am sure he will succeed. In making this report I have not covered up matters in the least, but, on the contrary, I have reported them exactly as I have found them. I ask the careful and considerate attention of your office, that my efforts may be seconded in remedying affairs to such an extent that this agency may be a credit to the service instead of otherwise.

Respectfully submitted.

N. S. WALPOLE,
United States Indian Agent.

INDIAN SCHOOLS.

The Indian industrial schools at Santa Fe and Albuquerque, supplemented by the several governmental schools at the various pueblos, are all doing fine work for the education of the Indian children. Nearly every Indian child in New Mexico is provided with the means of education, and the schools are very largely attended.

For many years it was difficult to obtain the consent of the parents for the education of their children at these public institutions, as they had much hesitancy in permitting their children to leave home and go under the control of the teachers. All this is now changed, and the parents are taking the greatest interest in the schools, in many instances showing an anxiety to have their children educated.

From present appearances, the majority of the Indian children of the Territory will be as well educated in a few years as the other youths of the Territory. The work being done in these institutions is such as to greatly improve the condition of these wards of the Republic, and will soon place them in a position to be self supporting.

SIR: In answer to your letter of the 12th inst., I have the honor to report as follows:

THE MESCALERO INDIAN AGENCY.

I assumed charge of this agency only four days ago, and consequently can give you only such data as I find on taking charge.

This agency is comprised of about 450,000 acres in Lincoln and Doña Ana Counties. There is very little arable land on the reservation. What there is, about 1,690 acres, the Indians have fenced, 800 acres of which they have under cultivation. There is some good grazing land on the reservation. The Indians have now on this land 1,000 horses, 20 mules, 60 burros, 40 cattle, 300 goats, and 4,000 sheep.

There are belonging to this tribe 444 Indians; 251 of them wear civilized dress and short hair, the balance, 193, wear the Indian style wholly or in part.

There are 168 families. Of these 14 draw full rations, 58 draw only beef, and the remainder (94) receive nothing in the way of free rations or clothing from the Government. One hundred and forty-two can carry on an ordinary conversation in English, and 117 can read.

No land has been allotted to these Indians, but it is expected that soon allotment will be made and the reservation thrown open.

I have the honor to be, very respectfully,

WALTER MCM. LUTTRELL,
United States Indian Agent.

HIS EXCELLENCY MIGUEL A. OTERO,
Governor of Territory of New Mexico.

ALBUQUERQUE, N. MEX., August 16, 1898.

DEAR SIR: I have the honor to make the following statement concerning the Albuquerque Indian school for the fiscal year ending June 30, 1898:

The total enrollment was 320, and the average attendance 301. This is as large a population as can be healthfully accommodated with our present plant.

A number of improvements have been made during the year, among which may be mentioned a new ring bath system for the pupils, the installation of electric lights, a new steel tank tower, the further development of our wells, whereby an abundant supply of pure water is obtained in place of the very bad water that we had heretofore.

The paramount need of the school for years has been a sewer system, and Congress at its last session appropriated \$14,000 for the purpose. When this system is completed the sanitary conditions will be changed from poor to excellent.

The health of the school has been good, despite the fact that there have been very mild attacks of scarlet fever and measles. No deaths have occurred for more than two years.

The pupils have made commendable progress both in the schoolroom and in the industries. Among our employes who are doing good work are a shoemaker, harnessmaker, assistant seamstress, and assistant cook who have learned their trade here alone, and other pupils are nearing a state of efficiency that will enable them to assume similar responsibilities.

The industries taught are sewing, cooking, laundering, carpentry, harnessmaking, shoemaking, tailoring, farming, and simple work in blacksmithing. A manual training department has been lately added to the institution, and it promises to be an important factor in Indian education, as it is in the public schools of the larger cities of the country.

In conclusion, I am pleased to say that the Indian problem is somewhat nearer a solution than it was a year ago, and while it is difficult to measure accomplishment by years, the effect of the total work done is plainly discernible.

Very respectfully,

EDGAR A. ALLEN, *Superintendent.*

HON. MIGUEL A. OTERO,
Governor of New Mexico, Santa Fé, N. Mex.

GOVERNMENT INDIAN SCHOOL AT SANTA FE.

The Santa Fe Indian Industrial School is located about 2 miles south of the city of Santa Fe on the Albuquerque road. It was opened in October, 1890, with a capacity of 150 pupils, and was created as an Indian normal school in January, 1894.

Present capacity.....	250
Capacity when buildings now under construction are completed.....	300
Proposed capacity.....	600
Average attendance during 1897-98.....	209
Total enrollment during 1897-98.....	250

Industries taught are cooking, sewing, housekeeping, tailoring, shoemaking, blacksmithing, carpentering, laundering, and farming and gardening by irrigation.

Number of employes are 17 white, 22 Indian, and 25 paid pupils as helpers.

Farm consists of 106 acres; 10 acres consisting of 5 acres of school campus and 5 acres of garden under irrigation.

Lighting: Coal-oil lamps. Heating: Coal and wood stoves.

Under construction: Electric light. Proposed heating: Steam.

The buildings are of brick, well and substantially built, and are named in order of size, as follows: Main school building, in form of Greek cross; central building 40 by 160 feet, two stories; each wing 40 by 140 feet, two stories.

Employees' building, brick, two stories, with storeroom, kitchen, dining room, and 14 employees' rooms, each with a large alcove; 2 bathrooms.

Hospital: Two stories with 10 rooms, dispensatory, and 2 bathrooms.

Laundry: One story, 3 rooms, and engine room; well equipped with steam washer, mangle, stationary tubs, centrifugal drier, etc.

Shoe and tailor shop: Two stories, 4 rooms. Tailor and 8 apprentices; shoemaker and 8 apprentices.

Store: One story, with basement.

Blacksmith shop: One story, frame. Capacity, 1 blacksmith and 6 apprentices.

Carpenter shop: One story, frame. Capacity, 1 carpenter and 6 apprentices.

All necessary barns, sheds, hose house, oil room, hennery, etc.

Water supply: From city water works; is abundant for all school needs and the irrigating of 10 acres.

Sewerage ample and in good condition.

Respectfully submitted.

ANDREW H. VIETS, *Superintendent.*

UNITED STATES COURT OF PRIVATE LAND CLAIMS.

SANTA FE, N. MEX., *August 5, 1898.*

MY DEAR SIR: Pursuant to your request contained in your letter of July 26, I beg to inclose herewith statements showing business transacted by the United States Court of Private Land Claims during the period beginning July 1, 1897, and ending July 6, 1898.

The statements are brought up to the date last named, for the reason that the last term of the court ended on that day.

All of the grants referred to in the statements are located within the Territory of New Mexico.

I remain, very respectfully,

MATT G. REYNOLDS,

United States Attorney, Court of Private Land Claims.

Hon. MIGUEL A. OTERO,

Governor of New Mexico, Santa Fe, N. Mex.

STATEMENT No. 1.

List of cases decided by the Court of Private Land Claims between July 1, 1897, and July 6, 1898.

P. L. C. docket No.	Name of grant.	Claimed.	Confirmed.	Rejected.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
69	Lucero Spring or Ojito de los Medanos	69,444	.....	69,444
209	Salvador Gonzales	23,661	200	23,461
85	San Antonio de la Huertas	150,000	20,000	130,000
90	Pueblo of Laguna	125,225	17,361	107,864
269	El Rito	511,000	.....	511,000
133	Vallecito de San Antonio	38,000	.....	38,000
136	Vallecito de Lobato	114,400	.....	114,400
196	Don Fernando de Taos	38,400	1,000	37,400
210	Cieneguilla (Santa Fe County)	45,245	5,000	40,245
141	Bartolome Sanches	10,000	10,000	.....
142	Salvador Lovato	2,500	.....	2,500
204	Antonio Armijo	900	.....	900
236	Archuleta and Gonzales	1,000	.....	1,000
149	Los Chupaderos de la Lagunita	4,340	.....	4,340
214	José Antonio Lucero	1,000	.....	1,000
243	Catarina Maese	300	.....	300
254	Juan Felipe Rodriguez	2,000	.....	2,000
93	De Vera	300	.....	300
102	Juan José Archuleta	500	.....	500
102				
104				
113				
117				
119				
120				
121				
124				

STATEMENT No. 1—Continued.

List of claims decided by the Court of Private Land Claims between July 1, 1897, and July 6, 1898—Continued.

P. L. C. docket No.	Name of grant.	Claimed.	Confirmed.	Rejected.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
125	Juan Antonio Flores	1,500	.....	1,500
145	Arquito	2,000	.....	2,000
171	Pueblo Quemado	900	.....	900
174	José Ignacio Martín	500	.....	500
175	Felipe Medina	300	.....	300
176	Manuel Fernandez	300	.....	300
187	Felipe Tafoya	500	.....	500
188	Manuel Tenorio	600	.....	600
189	Tomas Tapia	500	.....	500
190	Diego Arias de Quiros	2,000	.....	2,000
191	Alfonso Rael de Aguilar	500	.....	500
192	Felipe Pacheco	500	.....	500
199	José Manuel Giltome	6,000	.....	6,000
200	El Alamo	2,000	.....	2,000
254	Juan Estaban García de Noriega	5,000	.....	5,000
58	Bartolome Baca .....	.....	.....	47,740
123	Rio Tesuque .....	.....	.....	1,100
259	Ojo de San Jose	10,000	.....	10,000
205	Cañada de Cochiti .....	.....	10,000	.....
81	El Pino	9,000	.....	9,000
139	Miranda	4,658	.....	4,658
160	Ancon Colorado	800	.....	800
170	Sanguijuela	20,000	.....	20,000
173	Embudo	25,000	.....	25,000
134	Santo Domingo and San Felipe	20,000	.....	18,800
184		3,000	1,200	3,000
185	Diego Gallego .....	.....	.....	.....
179	Juan Bautista Valdez	150,000	1,200	148,800
181	Santa Cruz	60,000	.....	60,000
224	Rancho XXX El Rito	50,000	.....	50,000
232	Cristoval Crespin	3,000	.....	3,000
234	Alfonso Rael de Aguilar	17,361	.....	17,361
235	Antonio de Salazar	23,351	.....	23,351
237	Juan de Mestas	1,686	.....	1,686
242	Las Manuelitas	200,000	.....	200,000
248	El Coyote	434,028	.....	434,028
249	Manuel García de las Ribas	7,577	.....	7,577
250	Cristobal de Torres	205,615	.....	205,615
253	Juan de Ulibarri	500	.....	500
255	José Antonio Torres	5,000	.....	5,000
261	Antonio de Ulibarri	1,000	.....	1,000
266	Juan de Tafoya	86,000	.....	86,000
267	Santa Rosa de Cubero	5,000	5,000	.....
92	José García .....	.....	.....	109
	Total	2,508,891	70,961	2,491,879

STATEMENT No. 2.

Surreys of grants approved by the Court of Private Land Claims from July 1, 1897, to July 6, 1898.

P. L. C. docket No.	Name of grant.	Area in survey.
78	Los Cerrillos	1,478.81
79	Sitio de los Cerrillos	572.4
82	Sitio de Juana Lopez	1,085.53
45	Town of Atrisco	82,728.72
86	Juan de Gabaldon	10,690.05
95	Ojo de Borrego	16,079.80
195		
1	Cubero	16,490.94
84	Ignacio Chaves	47,258.71
α 88	Cañada de los Alamos	4,106.66
76		
207	Total	180,491.62

a Consolidated.

STATEMENT No. 3.

List of grants ordered resurveyed by the Court of Private Land Claims from July 1, 1897, to July 6, 1898.

P. L. C. docket No.	Name of grant.
16	Francisca Antonia Gijosa.
55	Sevilleta.
73	Pajarito.
17	Cañada de Santa Clara.
5	Arroyo Hondo.
15	Antonio Sedillo.
54	Galisteo.

STATEMENT No. 4.

List of cases tried and under advisement by the Court of Private Land Claims

P. L. C. docket No.	Name of grant.
194	Santa Cruz.
165	} Abo Mine.
206	
137	Santo Tomas de Iturbide.
138	Jose Manuel Sanchez Baca.
150	} Refugio Colony.
193	
151	Mesilla Colony.

DEAR SIR: Yours of July 18, requesting a summary of the business of the United States attorney's office received. In reply I submit the following:

Number of civil cases terminated during fiscal year.....	18
Judgments for United States.....	10
Judgments against the United States.....	6
Appealed to Supreme Court.....	2
Number of civil cases pending July 1, 1898.....	17
Number of criminal prosecutions terminated during the fiscal year ending June 30.	109
Number of convictions.....	47
Number of acquittals.....	17
Nol. pros., discontinued, or quashed.....	45
Number of criminal prosecutions pending July 1, 1898.....	42

Respectfully,

W. B. CHILDERS,
United States Attorney.

Hon. M. A. OTERO,
Governor, Santa Fe, N. Mex.

SANTA FE, N. MEX., August 20, 1898.

DEAR SIR: Responding to your favor of the 17th inst., asking for a report of the condition of this office at the present time, I beg herewith to inclose the same, and trust that it will be to your satisfaction.

I beg to remain, yours, very respectfully,

A. M. BERGERE.

Governor M. A. OTERO.

Report of the condition of the office of the first judicial district court from July 1, 1897, to June 30, 1898.

Territorial civil cases in force on July 1, 1897.....	146	
Territorial civil cases filed from July 1, 1897, to June 30, 1898.....	188	
	<hr/>	334
Cases disposed of by trial.....	79	
Cases dismissed.....	45	
	<hr/>	124
Balance of cases pending on July 1, 1898.....		210
	<hr/>	
Territorial criminal cases in force on July 1, 1897.....	75	
Territorial criminal cases filed from July 1, 1897, to June 30, 1898.....	88	
	<hr/>	163
Cases disposed of by trial.....	39	
Cases dismissed.....	52	
	<hr/>	91
Balance of cases pending on July 1, 1898.....		72
	<hr/>	
United States civil cases in force on July 1, 1897.....	9	
United States civil cases filed from July 1, 1897, to June 30, 1898.....	None.	
Dismissed or disposed of.....	None.	
	<hr/>	
Balance of cases pending on July 1, 1898.....		9
	<hr/>	
United States criminal cases in force on July 1, 1897.....	12	
United States criminal cases filed from July 1, 1897, to June 30, 1898.....	10	
	<hr/>	22
Cases disposed of by trial.....	9	
Cases dismissed.....	11	
	<hr/>	20
Balance of cases pending July 1, 1898.....		2

SIR: Replying to your letter of the 8th inst., I have the honor to submit the following report:

VALENCIA COUNTY.

Criminal cases pending on docket July 1, 1897.....	22	
Criminal cases instituted during the year ending June 30, 1898.....	14	
Total.....	<hr/>	36
Disposed of:		
Dismissals, 12; acquittals, 2.....	14	
Balance cases pending July 1, 1898.....	<hr/>	22
Civil cases pending July 1, 1897:		
Law, 28; chancery, 2.....	30	
Cases filed during the year ending June 30, 1898:		
Law, 8; chancery 1 (prior to adoption of code).....	9	
Civil actions (subsequent to adoption of code).....	27	
	<hr/>	36
Total.....	<hr/>	66
Disposed of:		
Dismissals, 7; trials, 15.....	22	
Balance cases pending July 1, 1898.....	<hr/>	44

BEENALILLO COUNTY.

Criminal cases pending on docket July 1, 1897.....	41
Criminal cases instituted during the year ending June 30, 1898.....	76
Total	117
Disposed of:	
Convictions, 32; dismissals, 10; acquittals, 3.....	45
Balance cases pending July 1, 1898.....	72
Civil cases pending July 1, 1897:	
Law, 161; chancery, 61.....	222
Cases filed during year ending June 30, 1898:	
Law, 18; chancery, 10 (prior to adoption of code)....	28
Civil actions (subsequent to adoption of code).....	252
Total	280
Disposed of:	
Dismissals, 45; trials, 168	213
Balance cases pending July 1, 1898.....	289
United States criminal cases pending July 1, 1897.....	3
United States cases instituted during year ending June 30, 1898.....	10
Total	13
Disposed of:	
Dismissals, 2; acquittals, 1; convictions, 6	9
Balance cases pending July 1, 1898.....	4
Civil cases pending July 1, 1897:	
Law, 13; chancery, 2	15
Cases instituted during year ending June 30, 1898	1
Total cases pending July 1, 1898.....	16

Respectfully,

HARRY P. OWEN, *Clerk.*

Hon. M. A. OTERO,
Governor of New Mexico, Santa Fe, N. Mex.

Causes pending in the fourth judicial district on June 30, 1897, new cases brought up to June 30, 1898, and disposition of same to June 30, 1898.

UNITED STATES.

CIVIL.

Pending June 30, 1897.....	6
New cases	1
Total	7
Disposed of (judgments).....	5
Pending June 30, 1898.....	2

CRIMINAL.

Pending June 30, 1897	10
New cases	31
Total	41
Disposed of:	
Dismissed, 15; trial, 14.....	29
Pending June 30, 1898.....	12

SAN MIGUEL COUNTY.

CRIMINAL.

Pending June 30, 1897.....	54
New cases	118
	<hr/>
	172
Disposed of:	
Trial and pleas.....	17
Dismissed	21
Change of venue.....	2
	<hr/>
	40
Pending June 30, 1898	132

CHANCERY.

Pending June 30, 1897	93
New cases	27
	<hr/>
	120
Disposed of:	
Trial	20
Dismissed	3
	<hr/>
	23
Pending June 30, 1898	97

LAW.

Pending June 30, 1897	186
New cases	111
	<hr/>
	297
Disposed of:	
By trial	41
Dismissed	12
	<hr/>
	53
Pending June 30, 1898	244

GUADALOUPE COUNTY.

CRIMINAL.

Pending June 30, 1897.....	27
New cases	2
	<hr/>
Pending June 30, 1898	29

LAW.

Pending June 30, 1897.....	6
New cases	6
	<hr/>
Pending June 30, 1898	12

CHANCERY.

Pending June 30, 1897.....	6
New cases	3
	<hr/>
	9
Disposed of (trial).....	1
	<hr/>
Pending June 30, 1898.....	8

UNION COUNTY.

CRIMINAL.

Pending June 30, 1897.....	25
New cases	56
	<hr/>
	81
Disposed of:	
Dismissed	23
Trial or plea	23
	<hr/>
	46
Pending June 30, 1898.....	35

LAW.

Pending June 30, 1897.....	20
New cases	24
	<hr/>
	44
Disposed of:	
Trial or plea	13
Dismissed	9
	<hr/>
	22
Pending June 30, 1898.....	22

CHANCERY.

Pending June 30, 1897.....	10
New cases	11
	<hr/>
	21
Disposed of:	
Trial or plea	7
Dismissed	5
	<hr/>
	12
Pending June 30, 1898.....	9

MORA COUNTY.

CRIMINAL.

Pending June 30, 1897.....	34
New cases	3
	<hr/>
	37
Disposed of (trial).....	1
Pending June 30, 1898.....	36

CHANCERY.

Pending June 30, 1897.....	32
New cases	7
	<hr/>
	39
Disposed of:	
Trial	1
Dismissed	2
	<hr/>
	3
Pending June 30, 1898.....	36

LAW.

Pending June 30, 1897.....	37
New cases	11
	<hr/>
	48
Disposed of:	
Trial	5
Dismissed	1
	<hr/>
	6
Pending June 30, 1898.....	42

COLFAX COUNTY.

CRIMINAL.

Pending June 30, 1897.....	64
New cases	55

119

Disposed of:	
Trial or plea.....	28
Dismissed	25

Pending June 30, 1898.....	66
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CHANCERY.

Pending June 30, 1897.....	47
New cases	19

66

Disposed of:	
Trial or plea.....	15
Dismissed	5

20

Pending June 30, 1898.....	46
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LAW.

Pending June 30, 1897.....	54
New cases	25

79

Disposed of:	
Trial	7
Dismissed	8

Pending June 30, 1898.....	64
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SOCORRO, N. MEX.

SIR: Below please find an abstract of the cases now pending in the fifth judicial district court:

CIVIL CASES.

Pending in this Territory on July 1, 1897 (Territorial).....	284
New cases filed between July 1, 1897, and July 1, 1898.....	204

Total pending during the year	488
Disposed of during the year	184

Pending on July 1, 1898	304
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CRIMINAL CASES.

Cases pending July 1, 1897	94
Filed during the year	145

Total.....	239
Disposed of.....	142

Pending July 1, 1898	97
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UNITED STATES CIVIL CASES.

Cases pending July 1, 1897	12
Filed during the year	5
Total	17
Disposed of	14
Pending July 1, 1898	3

UNITED STATES CRIMINAL CASES.

Cases pending July 1, 1897	18
Filed during the year	10
Total	28
Disposed of	23
Pending July 1, 1898	5

Very respectfully,

JOHN E. GRIFFITH, *Clerk.*

The GOVERNOR OF NEW MEXICO,
Santa Fe, N. Mex.

REPORT OF THE CLERK OF THE SUPREME COURT OF NEW MEXICO.

SIR: In compliance with your request for information regarding the business of the supreme court of the Territory of New Mexico, I respectfully submit the following statement:

At the beginning of the term of the supreme court just ended there were on the dockets of the court 22 cases which had been left untried since the preceding terms, and 57 cases were filed at the present term. The court worked continually during the whole term of the court, holding longer sessions than any of the preceding courts have ever held, and disposing of a greater amount of business. During the last term here were 39 cases argued and submitted to the court for its consideration, 1 case was stricken from the docket, 3 were dismissed, and the court handed down opinions in 23 cases involving great points of interest to the public, and 25 cases were finally disposed of.

The supreme court also entered an order changing the place of holding the term of the court in the third judicial district from Silver City to Las Cruces, in the said district. The court expects to hold an adjourned session in order to clear the docket of the cases now remaining untried.

The files of this office are not in a very desirable condition, owing to the fact that the office is not provided with its permanent quarters and a vault in which to keep all the papers of importance; but it is hoped that by the next term of the court the new capitol, now under course of construction, will be complete, in which building the clerk of the supreme court will be provided with all that is necessary to keep the papers in perfect order, so that reference can be made to them with no trouble.

The records of my office show that at this date there are 125 members of the bar of New Mexico. A large majority of the attorneys are members of the New Mexico Bar Association, and the officers of said association for the year 1898-99 are as follows: President, Hon. R. E. Twitchell, Las Vegas, N. Mex.; secretary, Hon. E. L. Bartlett, Santa Fe, N. Mex.; treasurer, Hon. George W. Knaebel, Santa Fe, N. Mex.

There are also five vice-presidents (one from each judicial district), as follows: First district, Hon. E. A. Fiske, Santa Fe, N. Mex.; second district, Hon. E. W. Dobson, Albuquerque, N. Mex.; third district, Hon. T. F. Conway, Silver City, N. Mex.; fourth district, Hon. W. C. Wrigley, Raton, N. Mex.; fifth district, Hon. A. A. Freeman, Eddy, N. Mex.

During the year 1898 there have been eight attorneys admitted to practice before the courts of New Mexico.

Trusting that this information will be satisfactory, and awaiting your further commands, I remain,

Yours, most respectfully,

JOSE D. SENA,
Clerk Supreme Court of New Mexico.

His Excellency MIGUEL A. OTERO,
Governor of New Mexico, Santa Fe, N. Mex.

OFFICE OF THE CAPITOL REBUILDING BOARD,
Santa Fe, N. Mex., September 24, 1898.

SIR: In compliance with your request for a report from the capitol rebuilding board of its work of rebuilding the Territorial capitol, I have the honor, in behalf of the board, to respectfully report that the work is progressing as rapidly, consistent with good workmanship, as possible, taking into consideration the amount of money appropriated by the legislature for the purpose. It has been and still is the earnest desire of the board to keep within the appropriation of \$75,000, and to this end every saving has been and will be made, and for this reason we have found it impossible to rush the work because of the additional expense such speed would entail. The building is now almost ready for the roof, but it will necessarily take several months before the interior can be made ready and the structure completed, and it is regretted that it will not be ready for the meeting of the coming session of the legislature. The architects, Messrs I. H. & W. M. Rapp, have proved themselves thoroughly competent and reliable in every respect, and we take great pleasure in assuring your excellency that the new capitol will be the pride of the Territory. We found it necessary to face the building with buff Roman brick above the first story, for the reason that the stone at Lamy was not of proper quality in sufficient quantities to be used for such purpose; but that necessity, in our opinion, will prove the Territory's gain, as the building will present, when finished, a much better appearance than had it been entirely faced with the stone mentioned, the contrast between the first story of stone and the other stories of the pressed brick mentioned being very pleasing. While it is perhaps possible that the building can be completed within the amount realized from the appropriation for the purpose, and while it shall be the aim of the board to attain this result, it is proper to say at this time that there is grave doubt as to our ability to do so, certainly of our ability to furnish the building within the amount available. If after having done our best we find that a further amount is still necessary, we shall report the facts fully to your excellency for presentation to the coming legislature. We believe that that body and the people of New Mexico will approve our efforts to secure them a capitol building first class from foundation to dome, and if in attaining this end a little more cost than at first contemplated is incurred, we are confident that the additional expense will be readily approved and provided for by the people upon a full presentation of the facts. With the facilities at hand we confidently expect to turn over upon completion a building whose value shall be at least double the amount of money actually put into it, and whose equipment and construction shall be in all respects worthy of our prosperous and growing Territory.

Respectfully submitted.

F. A. MANZANARES,
President Capitol Rebuilding Board

His Excellency MIGUEL A. OTERO,
Governor of New Mexico.

TERRITORIAL BOARD OF HEALTH.

LAS VEGAS, N. MEX., September 12, 1898.

DEAR SIR: In reply to your request of recent date with reference to a report from the Territorial board of health, I beg to submit the following:

The number of licenses issued to date are 113; number of regular physicians, 98; homeopaths, 13; eclectic, 2, making a total of 113 practicing physicians in our Territory.

Those physicians engaged in general practice have their county medical societies and a Territorial association which holds regular annual sessions. The standard of the profession is high, and graduates from the best medical colleges in the world are to be found among them. The medical profession of New Mexico keeps abreast of the times.

The requirements of the Territorial board of health for physicians desiring to practice medicine in New Mexico are as follows: "The applicant must present his high-school certificate, or its equivalent; must show evidence that he has taken four courses of study, of which no two courses were taken in the same year, or he must pass a satisfactory examination by this board of health.

Members of the board of health.—W. R. Tipton, M. D., president, Las Vegas, N. Mex.; J. W. Kinsinger, M. D., vice-president, Roswell, N. Mex.; G. S. Easterday, M. D., treasurer, Albuquerque, N. Mex.; J. M. Cunningham, M. D., secretary, East Las Vegas, N. Mex.; J. H. Sloan, M. D., Santa Fe, N. Mex.; William Eggert, M. D., Santa Fe, N. Mex.; C. B. Kohlhausen, M. D., Raton, N. Mex.

Yours, very respectfully,

J. M. CUNNINGHAM, M. D.,
Secretary Board of Health.

His Excellency, Governor M. A. OTERO,
Santa Fe, N. Mex.

NEW MEXICO BOARD OF DENTAL EXAMINERS.

The National Association of Dental Examiners, of which New Mexico is a member, is composed of the boards of examiners of the various States and Territories. The object of the association is the strengthening and assisting of each individual board and the raising of the standard of dental education.

Through the national association the examining boards of the whole country are kept in touch, and there can be no doubt of the benefit to each board by the association of all.

In accordance with chapter 60, section 10, General Laws of New Mexico for 1893, the New Mexico board of dental examiners has the honor to submit its fifth annual report, which is as follows:

The sixth annual meeting was held at Silver City on September 2 and 3, 1898.

There were present Drs. Olney, Bearup, White, and Manley. Dr. Chamberlain's duties as first lieutenant in the Territorial Volunteers at Whipple Barracks, Ariz., prevented his attendance.

There were 8 applications for registration, all graduates of colleges recognized as reputable. Of these, 5 were granted certificates, and 3 were refused for the reason that they had left the Territory since filing their applications. One application was from a college not recognized, which was refused. (Chap. 60, sec. 5, Laws of New Mexico, 1893.)

In connection with this case the following resolution was passed: "*Resolved*, That this board will not grant, without examination, a certificate to a graduate of any college not conforming to the rules as adopted by the National Association of Dental Examiners."

There were 2 candidates for examination; both failed to pass and were refused registration. Both of these men expressed their appreciation of the fairness of the examination and agreed to meet the board again at its next annual meeting.

Since the law pertaining to the practice of dentistry in New Mexico went into effect in 1893, 34 permanent certificates have been granted, 29 temporary certificates, and 5 examinations have been given, 3 passing successfully and 2 failing.

RECEIPTS.

Received from 8 applications for registration	\$40
Received from 3 applications for examination.....	75
Cash with treasurer.....	118

Total	233
Expenditures	233

Respectfully submitted.

F. E. OLNEY, *President*.
D. W. MANLEY, *Secretary*.

His Excellency, Governor M. A. OTERO,
Santa Fe, N. Mex.

BOARD OF PHARMACY.

W. C. Porterfield, secretary of the board of pharmacy of New Mexico, submits the following statement, which is the eighth annual report of said board:

Number of pharmacists registered, as shown by last report.....	77
Number of pharmacists registered since last report.....	18
Number holding minor certificates	10

Total	105
Dropped for nonpayment of renewal fees.....	11

Number now registered	94
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SURVEYOR-GENERAL.

The following is taken from the annual report of the United States surveyor-general for the district of New Mexico, June 30, 1898:

During the said fiscal year 12 contracts (numbered 314 to 325, both inclusive) and 11 contracts under special instructions have been awarded for the survey of public lands, private land claims, or grants (confirmed by the Court of Private Land

Claims) and small holding claims (filed under the provisions of sections 16 and 17 of the act of Congress approved March 3, 1891, and amended February 21, 1893.) Of said contracts 11 are for the survey of public lands, and 12 for the survey and corrected surveys of private land claims, which have been confirmed by the Court of Private Land Claims. Some of the contracts for surveys of public lands include the survey of small holding claims situate within the stated townships to be surveyed under said contracts. Four contracts for the survey of public lands are payable from the appropriation for the survey of public lands per act of June 4, 1897, for the fiscal year ending June 30, 1898. Seven contracts or sets of special instructions, providing for retrenchments and resurveys, are payable from the appropriation of \$15,000 for resurveys per act of June 4, 1897, for the fiscal year ending June 30, 1898. Nine contracts and 3 sets of special instructions, providing for surveys and corrected surveys of private land claims, are payable from the appropriation of \$15,000 per act of June 4, 1897, for the survey of confirmed private land claims in designated States and Territories. The total number of miles, as shown by returns, 2,401 miles, 74 chains, and 88 links.

During the fiscal year the following letters, documents, plate, field notes, and other papers, briefed and recorded in total, are 15,684.

Tracings and descriptive lists, plate, etc., have been furnished the district land offices in this Territory as follows:

Santa Fe	118
Las Cruces	24
Roswell	4
Total	146

MINING SURVEYS.

During the said fiscal year there has been deposited on account of the surveys and amended surveys of mining claims \$2,170, and applications were daily made for the survey of 71 mining claims, the amended survey of 2 mining claims, and reports on 52 placer mining claims.

During the said fiscal year 54 mineral monuments, located in various unsurveyed townships in this district, have been platted.

The surveyor-general urges an appropriation for the restoration of mineral monuments and their proper connection with public surveys and with each other, stating that the major portion of the mineral monuments in this district are upon unsurveyed ground, and mining claims are connected with said mineral monuments, these monuments being established many years ago, without sufficient regard to their permanence in construction, and insufficiently witnessed by bearings and permanent objects. In most cases a mound of stone or a post was generally used. During the lapse of time since they were established many of these monuments have become obliterated or have been destroyed, and as said monuments are the official points of reference by which to fix the locus of all surveyed and patented mining claims in this district it is of the greatest importance that they be properly perpetuated; and where the same have been obliterated they should be reestablished with due regard to permanency, and their locus witnessed by connecting them with public surveys, with each other, and with natural objects.

The Court of Private Land Claims has, during the fiscal year, passed upon the validity of many private land claims, some of which have been confirmed and some rejected by said court. There are still about 74 private land claims to be tried by the Court of Private Land Claim. Forty-six of these grants contain approximately 5,000,000 and the 74 grants contain approximately 10,000,000 acres. It is safe to predict that 50 or 60 per cent of these grants will be confirmed in part or in their entirety, and from the best information obtainable by this office I believe that about 45 of these grants will be confirmed. There are some 18 or 20 cases on appeal to the United States Supreme Court, and a large number of other grants which have been confirmed, but no appeals as yet taken, which will have to be surveyed at an early date; all of which private land claims should be adjudicated by the Court of Private Land Claims and all unfinished business of said court completed within the life of the court.

SMALL HOLDING CLAIMS.

There have been 3,205 small holding claims filed in this office under the provisions of sections 16 and 17 of the act of March 3, 1891, amended February 21, 1898, for tracts of land not exceeding 160 acres each. There are about 1,800 small holding applications on file in this office for tracts of land in unsurveyed townships and within the boundaries of unconfirmed grants.

MINING DISTRICTS.

Number of mining districts platted	77
Number of plate comprising said districts	138

UNITED STATES LAND OFFICES.

Following are the reports for several land offices:

CLAYTON, N. MEX., July 12, 1898.

SIR: We have the honor to transmit to you our statement of the business transacted at this office for the fiscal year ending June 30, 1898; also lands appropriated and unappropriated in this land district for the year ending June 30, 1898.

Very respectfully,

EDWARD W. FOX, *Register.*

ALBERT W. THOMPSON, *Receiver.*

Governor M. A. OTERO,
Santa Fe, N. Mex.

Class of entries, number, acres, etc., for Clayton land district.

Class of entries.	No.	Acres.	Commissions.	Fees.	Amount.
Excess payment on homestead and other entries and locations.....	15	35.01	.....	.....	\$43.71
Final timber claims commuted.....	1	180.00	.....	.....	200.00
Original entries under desert act.....	2	278.95	.....	.....	69.73
Homesteads commuted to cash (R. S. 2301).....	2	240.00	.....	.....	300.00
Sale of isolated tracts (section 2455, R. S.).....	1	40.00	.....	.....	50.00
Total cash sales.....	21	753.96	.....	.....	663.44
Original homestead entries.....	287	45,139.66	\$1,698.32	\$2,845.00	4,544.82
Additional homestead entries to No. 766.....	1	40.00	1.50	5.00	
Final homesteads.....	155	24,478.36	917.49	.....	917.49
Final timber claims.....	6	960.00	24.00	.....	24.00
Testimony received.....	.....	.....	.....	342.40	342.40
Coal declarations.....	4	640.77	12.00	.....	12.00
Total, all classes.....	474	72,010.75	2,648.31	3,192.40	6,504.15
Salary, fees, and commissions, register and receiver.....	.....	.....	.....	.....	4,003.98
Depositing public moneys.....	.....	.....	.....	.....	1 10
Incidental expenses.....	.....	.....	.....	.....	247.36
Total.....	.....	.....	.....	.....	4,252.44

County.	Area in acres unappropriated and unreserved.			Area in acres appropriated.	Total area of land surface of the county in land district.
	Surveyed.	Unsurveyed.	Total.		
Colfax.....	547,324	.....	547,324	82,676	630,000
Guadalupe.....	2,642,842	115,380	2,758,222	183,778	2,942,000
Mora.....	322,551	.....	322,551	16,449	339,000
San Miguel.....	733,047	.....	733,047	62,953	796,000
Union.....	3,424,180	370,020	3,794,200	345,800	4,140,000
Total.....	7,669,944	485,400	8,155,344	691,656	8,847,000

LAS CRUCES, N. MEX., July 21, 1898.

SIR: I have the honor to transmit to you, inclosed herewith, a copy of the register's annual report of the public domain within the Las Cruces land district for the year ending June 30, 1898.

Very respectfully,

EMIL SOLIGNAC, *Register.*

His Excellency MIGUEL A. OTERO,
Governor of New Mexico, Santa Fe, N. Mex.

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Counties, area, etc., of Las Cruces land district.

County.	Area in acres unappropriated and unreserved.			Area in acres reserved.	Area in acres disposed of.	Total area of land space in land district.
	Surveyed.	Unsurveyed.	Total.			
Donna Ana	4, 113, 367	682, 445	4, 795, 812	333, 378	121, 810	5, 253, 000
Grant	3, 857, 453	1, 472, 577	5, 330, 030	7, 414	648, 556	5, 986, 000
Lincoln	67, 859	251, 825	319, 684	70, 000	10, 316	400, 000
Sierra	1, 527, 183	274, 379	1, 801, 562	74, 875	96, 563	1, 973, 000
Socorro	5, 196, 518	2, 076, 501	7, 273, 019	337, 459	127, 522	7, 738, 000
Total	14, 762, 380	4, 757, 527	19, 520, 107	825, 126	1, 004, 767	21, 350, 000

ROSWELL, N. MEX., July 21, 1898.

SIR: In compliance with your letter of the 19th instant, we have the honor to transmit herewith statement of the business of the United States land office at Roswell, N. Mex., for the fiscal year ending June 30, 1898.

Very respectfully,

HOWARD LELAND, *Register.*
DAVID L. GEYER, *Receiver.*

Hon. M. A. OTERO,
Governor of New Mexico, Santa Fe, N. Mex.

Statement of the business transacted at Roswell, N. Mex., during the fiscal year ending June 30, 1898.

Class of entry.	No.	Acres.	Commissions.	Fees.	Amount.
Sales of land subject to preemption entry ..	1	160.00	.....	.....	(a)
Sales of coal lands	2	320.00	.....	.....	\$3, 200.00
Sales of mineral land	1	594	.....	.....	5.00
Excess payments on homestead entries	3	4.08	.....	.....	5.12
Original entries under desert-land act	17	2, 674.35	.....	.....	668.59
Final entries under desert-land act	10	[2, 039.79]	.....	.....	1, 599.80
Homestead entries commuted to cash	4	[600.00]	.....	.....	750.00
Total cash sales	38	3, 159.024	.....	.....	6, 228.51
Original homestead entries	77	11, 462.81	\$429.88	\$730.00	.....
Final homestead entries	42	[6, 264.29]	234.93	.....	.....
Coal-land applications	35	.....	.....	105.00	.....
Final timber-culture entries	2	[320.00]	8.00	.....	.....
Fees received for reducing testimony to writing .....	.....	.....	.....	198.51	.....
Cancellation fees .....	.....	.....	.....	5.00	.....
Total of all classes of entries and amounts received	194	14, 621.834	672.81	1, 038.51	6, 228.51

a Paid for in 1893 Allowed by letter "G," April 26, 1898.

SANTA FE, N. MEX., July 19, 1898.

SIR: As per request of your letter of the 15th instant, we have the honor to transmit herewith an abstract showing the business transacted in this office during the fiscal year ending June 30, 1898.

The areas of all lands in our district subject to settlement entry or filing are reported in the first, second, and third columns, those surveyed in the first, those unsurveyed in the second, and the aggregates surveyed and unsurveyed in the third. In the fourth column are reported the area of all lands reserved for any purpose, which, however, may be eventually restored to the public domain, such as unconfirmed grants. The areas embraced in all selections, filings and entries, perfected and unperfected, as also grants confirmed during the fiscal year, are reported in the fifth and sixth columns. In the eighth column is reported the business transacted in the office during the fiscal year outside of confirmed grants.

Respectfully,

MANUEL R. OTERO, *Register.*
E. F. HOBART, *Receiver.*

Hon. MIGUEL A. OTERO,
Governor of New Mexico, Santa Fe, N. Mex.



INSANE ASYLUM, LAS VEGAS.

County.	Area unappropriated and unreserved.			Area reserved.	Area appropriated.	Area appropriated during fiscal year 1898.	Total area of land surface of the county in land district.	Area appropriated during fiscal year ending June 30, 1898, outside of confirmed grants.
	Surveyed.	Unsurveyed.	Total.					
Bernalillo.....	1,858,594	430,600	2,289,284	949,037	2,190,940	277,739	5,707,000	6,166
Colfax.....	230,461	23,040	253,501		1,538,205	3,139	1,794,845	3,139
Guadalupe.....	1,045,233	10,000	1,055,233		530,280	4,247	1,589,760	4,247
Mora.....	414,055	102,160	516,215		727,900	4,885	1,249,000	4,885
Rio Arriba.....	1,484,529	799,400	2,283,929	841,361	1,131,640	2,070	4,259,000	2,070
San Juan.....	1,025,184	484,440	1,509,624	1,958,400	225,040	3,936	3,697,000	3,936
San Miguel.....	845,952	89,860	935,812	202,550	1,176,190	16,448	2,331,000	16,448
Santa Fe.....	558,726	60,136	618,862	188,900	556,463	18,174	1,382,400	4,325
Socorro.....	1,129,903	128,080	1,257,983		890,017		2,148,000	
Taos.....	304,430	358,720	663,151	119,931	668,967	17,952	1,470,000	1,600
Valencia.....	2,391,812	313,620	2,705,432	634,563	2,491,668	17,337	5,849,000	846
Total.....	11,282,879	2,800,147	14,089,026	4,894,742	12,127,310	365,927	31,477,005	47,662

NEW MEXICO INSANE ASYLUM.

LAS VEGAS, N. MEX., August 1, 1898.

SIR: In compliance with your request, we hand you herewith our report of the New Mexico Insane Asylum for the year ending June 30, 1898.

Since our last report we have completed the new addition to the asylum known as the south wing and passage.

This addition was badly needed on account of the overcrowded condition in what is known as the administration building.

We have been obliged to house all of the patients in the latter building, besides furnishing quarters for the steward, matron, and attendants in the same building, thereby making it very unpleasant for the latter, and crowding the patients into sleeping quarters entirely too close for their proper treatment.

Arrangements for lighting the new building, as well as the old one, by electricity, have been made with the Light and Fuel Company, of Las Vegas, on very favorable terms, and we hope in a week or two that they will have the wires run and all connections made, thereby enabling us to move into our new quarters without further delay.

It is our intention, or rather our wish, to thoroughly overhaul the administration building from top to basement, if we can induce the next legislature to furnish us with the necessary funds.

This building has been constantly in use ever since the asylum was opened in May, 1893, and should now have some extensive repairs and alterations of the interior arrangement. However, we will go more into detail regarding this matter, and our needs for the future, in our report to you next November, a description of the new building being more appropriate at this time, coupled with a statement of the very satisfactory progress we have made during the past year.

The south wing and passage were designed and erected under the supervision of Messrs. I. H. & W. M. Rapp, architects, and we draw largely on notes furnished by them in the following description:

The addition known as the south wing of the New Mexico Insane Asylum has a southern exposure of 164 feet frontage and 47½ feet of depth, and contains three stories, basement and attic. The basement is used for heating and ventilating trunks, also for storage and shops. The attic is occupied with the ventilating ducts and tank rooms. The foundation is built of white sandstone; the superstructure of the Santa Fe penitentiary brick, excepting the face course of the south and east fronts, which consist of pressed brick. All the interior walls throughout are of brick, and every care has been exercised to make the building a slow burning construction. Each corridor is fitted with a rack containing 75 feet of hose connected to a stand pipe carrying the water-works pressure.

Traversing the whole length of the building on each floor is a corridor, 15 feet wide, and intersecting at the middle is a sun room, 20 feet wide. These spacious apartments were designed for the comfort of the inmates, who are compelled to be in the building a considerable portion of the time. Off this corridor are the 27 rooms for patients, 2 dormitories, toilet and bath rooms, on each floor. Each room is well lighted, with a heavily-guarded window, and contains 80 square feet of floor surface. The dormitories will comfortably admit six beds each.

The floors throughout are made of narrow, perpendicular grain, yellow pine, filled

with a nonabsorbent solution, which aids materially in cleansing. Temporarily the third floor has been divided and arranged into two violent wards, with extra heavy guards for all the windows, and iron-grating doors. It is the ultimate intention to remove these wards from the building to isolate wards.

Each floor has its bath and toilet room, with cement floor, supported on vaulted masonry. The fixtures are of enameled cast iron, and are supplied with cold water from the 4,000 gallon tank in the attic, and with hot water from the heater in the power house. The shower and needle baths, which are in addition to the tub baths, are incased in heavy galvanized-steel stalls; and with the mixing chamber, thermometer, and controlling valves, enable the attendant to adjust to a degree the temperature of the water.

A feature worthy of mention is the master key or interlocking system, controlling all the locks in the building. Each door of each ward has its own key, operating that lock alone; there then is a master key operating all the locks in that ward, but it will not operate the locks in any other ward. All the wards are then put under one master key, held only by the steward and medical superintendent.

There are two stairways incased in brick walls extending from the basement to the third story, and located at each end of the building, to guard against any portion of the building being cut off in event of accident by fire. These stairways connect with the entrance to the building and to the two-story and basement passageways leading to the dining rooms and the administration building (which the old building is being converted into). An extension of 20 by 25 feet has just been completed, with its pantries, which adds at least one-third to the seating capacity of the old dining room.

The new building contains 82 rooms for patients and attendants, 6 dormitories, and 4 bath and toilet rooms.

The power house and laundry is 50 by 30 feet, 25 feet high, with smoke stack 85 feet high, and is located 55 feet from the new building and 75 feet from the administration building, being connected to each with a tunnel 34 by 6 feet. The heating and ventilating system is what is known as a low-pressure fan system. The fresh air, being taken in at the power house, is forced through the tunnel by a 10-foot steel housed fan, driven by a low-pressure engine. The fresh air from the tunnel passes into the heating chamber, containing over 1 mile of 1-inch steel pipe, which heats the air to the desired temperature, which is controlled and regulated by the engineer at the power house. The fan forming a pressure in the tunnel and heating chamber forces the air into galvanized-iron ducts to every room and corridor in the building, the fresh air entering the rooms 7 feet above the floor and dispelling the vitiated air at the floor line of each room into metal-lined ducts and to the large ventilators on the roof.

A battery of three 14-foot boilers generates steam for the heating, also power for the engines and laundry. By actual tests with the anemometer, it was found that with the fan speeding at 200 revolutions per minute, the air in all the rooms was changed every eight minutes, and in the corridors every twenty minutes. A circulating hot water heating apparatus for furnishing hot water to the bath rooms is provided to work the steam plant, and also separately. A set of speaking tubes furnish means of communication from each floor of the building to the power house.

A sewerage system has been installed disposing of the sewage by evaporation, the residuum being used to enrich the soil.

The excavating for the building, power house, tunnels, sewers, etc., besides the quarrying of the stone required in the construction of the power house, was done by the steward of the asylum with the inmates, at a saving of \$1,800 to the Territory.

We take more than ordinary pleasure in handing you herewith the annual reports of Dr. W. R. Tipton, medical superintendent, and Mr. George W. Ward, steward.

LAS VEGAS, N. MEX., June 30, 1898.

The Honorable Board of Directors of the New Mexico Asylum for the Insane:

GENTLEMEN: Complying with the request of your president, I hereby submit the following report for the year ending June 30, 1898:

My term of office began December 1, 1897, succeeding a most worthy and able predecessor, Dr. F. Marron y Alonzo.

This institution was opened for the reception of patients May 2, 1893, and since that time 123 unfortunates have been regularly received for treatment.

The first building erected was designed and intended to be used as an administration building, and hence was not suitable for the reception and care of patients. Very soon after this institution was opened the number of applications for admission increased very rapidly, which forced the administration to limit the number admitted, on account of the very limited amount of room, and to establish a quota for each county, based upon the number of population. Notwithstanding this wise precaution, the institution has been at all times overcrowded.

At present there are 57 inmates, of which 33 are males and 24 females, classified as follows:

Dementia	29
Epileptic insanity	3
Delusional insanity	4
Insanity of adolescence	1
Idiocy	4
Acute mania	3
Subacute mania	4
Chronic mania	8
Moral insanity	1
Total	57

During the past year there have been 13 admissions, of which 8 were males and 5 females.

DEATHS.

There have been seven deaths, due to the following causes:

Epilepsy	1
Inanition	2
Maniacal exhaustion	1
General paralysis	1
Pneumonia	1
Total	7

DISCHARGED.

Cured	1
Improved	1
Unimproved	2
Escaped	1
Total	5

Average daily attendance for the year, 58½.

By the above classification of patients you will notice that the greater number of them are hopelessly incurable, having been so before admission.

Since the opening of this institution the number of chronic and incurable cases admitted has gradually, but steadily, increased, until the vacancies have been reduced to a very few, rendering it impossible, for lack of room, to admit many curable patients. This fact will account for the small number discharged as cured.

I am convinced that of the many cases now confined in the various county jails in the Territory a large number have and will become incurable for lack of early and appropriate treatment.

IMPROVEMENTS.

During the last year a good hospital building and engine house have been built and are now about ready for occupancy, so that the overcrowded and inadequate quarters, especially the insufficient bathing facilities contended with so long, will soon be overcome.

The new hospital is a three-story brick structure substantially built, having wide corridors well lighted and capable of thorough ventilation. Cells have been provided for the violent patients.

There are four new bath and toilet rooms, having two bath tubs and four rain baths. This increase in the bathing facilities is most pleasing, and will prove to be one of the best provisions made in the new addition.

The engine house is a one-story brick building well separated from other buildings, with engine and boilers sufficient to supply the entire plant with heat, hot water, ventilation, and power for laundry, etc.

In addition to the above improvements a large amount of grading has been done, fruit and shade trees have been planted, roses and other ornamental plants have been added, and the vegetable garden has been enlarged.

The daily and monthly cost per capita has been as follows:

	Per day.	Per month.
Counting food only	\$0.13 $\frac{6}{10}$	\$4.13
Counting all expenses .....	.56 $\frac{1}{2}$	17.24

The above figures are lower than those of preceding years. For a more detailed account of expenses I will refer you to the report made by the steward.

Very respectfully submitted,

W. R. TIPTON, M. D.,
Medical Superintendent.

LAS VEGAS, N. MEX., July 25, 1898.

The Board of Directors of the Insane Asylum of New Mexico.

GENTLEMEN: Pursuant to request of the president of your honorable body, I herewith submit a report covering that part of the expense of operating the insane asylum of New Mexico coming under my immediate charge for the period beginning July 1, 1897, and ending June 30, 1898.

AMOUNTS EXPENDED OR CONSUMED IN THE SEVERAL ACCOUNTS.

Food supplies.....	\$5,253.97
House furnishing.....	844.41
Kitchen furnishing.....	18.55
Dining-room furnishing.....	10.80
Laundry furnishing.....	10.55
Light and fuel.....	491.24
Stable.....	477.46
Miscellaneous.....	25.00
Home industry.....	23.51
Water service.....	300.00
General repair.....	206.10
Live stock.....	18.00
Insurance.....	280.00
Salary of officials and attendants.....	6,489.99
Total.....	14,449.58
Less supplies furnished from home industry account included in above.....	2,376.54
Total cash outlay.....	12,073.04
Average daily attendance of patients.....	584
Number of meals furnished patients.....	64,069
Food supplies consumed.....	5,253.97
Less net amount furnished from home industry account.....	2,353.03
Balance actual cash cost food supplies.....	2,900.94
Cost of food per day per patient.....	.13 $\frac{6}{10}$
Cost of food per month per patient.....	4.13
Total cash outlay as above.....	12,073.04
Average expense per patient for the year.....	206.38
Average expense per patient per month.....	17.24
Average expense per patient per day.....	.56 $\frac{1}{2}$
Average expense per patient per meal.....	.18 $\frac{1}{2}$

FARM AND GARDEN.

The cultivation of a farm and garden being in an experimental stage, I am pleased to report the products as follows:

Vegetables of various kinds.....	pounds..	65,000
Home-raised pork.....	do.....	2,087
Milk.....	gallons..	2,248 $\frac{1}{2}$
Fodder.....	shocks..	32
Oats.....	pounds..	1,000
Corn.....	do.....	1,207

Several hundred dozen of cucumbers, lettuce, rhubarb, roasting ears, and celery, which were not weighed, amounting at market valuation to...	\$2,376.54
Entire cost to the board.....	348.51

Leaving net profit of.....	2,028.03
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The labor of cultivating and storing being performed wholly by patients, except as deduction above.

LABOR OF PATIENTS IN CONNECTION WITH NEW BUILDING.

I have to report labor performed by patients in excavating for the south wing of the asylum building, passageway, and boiler house, Superintendent Rapps's estimate, as follows:

1,666 cubic yards excavation, at 30 cents.....	\$499.80
988 cubic yards excavation, at 37½ cents	370.50

Total	870.30
Deduct for cost of extra labor.....	91.64

Leaving balance performed by patients.....	778.66
Stone quarried by patients, hauled to building by asylum team, and used in the construction thereof—200 perch, at 90 cents per perch	180.00
For excavating sewer ditch from boiler house to outlet on boulevard (Superintendent Rapps's estimate), 325 feet, at \$1.20 per foot	390.00

Total value patients' labor on new building and grounds.....	1,348.66
Net product of farm and garden, labor performed by patients.....	2,028.03

Grand total for patients.....	3,376.69
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Thanking the board for their unanimous support and wise counsel, and soliciting a continuation of the same, the foregoing is respectfully submitted.

GEORGE W. WARD, *Steward.*

It will be noticed from these reports that the average cost per patient for the year is only \$206.38, which includes the best of medical attendance as well as food, lodging, clothing, and any other necessities they may require, and reflects great credit upon these officials for their very careful and economical management.

Our officials are great believers in the curative properties of an outdoor life, coupled with some healthful occupation, and the result is the steward keeps the less violent patients at work in the garden and about the buildings as much as their several conditions will permit, thereby benefiting the patients and saving to the asylum in last year's work alone the sum of \$3,376.69.

Their work during the past year has consisted largely in excavating for the new building and boiler house, in addition to digging for the sewers, as well as working in the garden, and the figures just given represent what we would have been obliged to pay out if the work had been done by other parties.

Please allow us in conclusion to thank you for the deep interest you have always shown in our institution, which has been manifested in the many visits made us in your official capacity, and to request a continuance of the same during the year upon which we have just entered.

Respectfully,

JOHN W. ZOLLARS,
FRANK S. CROSSON,
MARCUS BRUNSWICK,
BENIGNO ROMERO,
FRED H. PIERCE,
Board of Directors.

Hon. MIGUEL A. OTERO,
Governor of New Mexico, Santa Fe, N. Mex.

NEW MEXICO PENITENTIARY.

SIR: I have the honor to submit for your information an annual report of the New Mexico Penitentiary for the year commencing July 1, 1897, and ending June 30, 1898.

POPULATION.

Convicts in confinement July 1, 1897.....	203
Received from Territorial courts.....	92
Received from United States courts.....	8
Returned from courts.....	1
Recaptured.....	1
Total number of convicts in confinement during the year.....	306
Discharged upon expiration of sentence with full allowance of good time..	55
Discharged without full allowance of good time.....	17
Pardoned by Governor M. A. Otero.....	9
Pardoned by Acting Governor Wallace.....	2
Pardoned by the President of the United States.....	1
Sentence suspended by Governor Otero.....	1
Escaped.....	2
Taken out by order of the court.....	1
Died.....	2
	90

Convicts in confinement June 30, 1898..... 215

Showing an increase of 12 over the number of the preceding year. This increase is small in proportion to the present population of the Territory.

Of the 100 convicts received during the year, the following-named counties furnished, to wit:

Bernalillo County.....	10	Rio Arriba County.....	5
Chaves County.....	5	San Juan County.....	1
Colfax County.....	5	San Miguel County.....	18
Donna Ana County.....	5	Santa Fe County.....	8
Eddy County.....	5	Sierra County.....	1
Grant County.....	9	Socorro County.....	16
Lincoln County.....	7	Union County.....	5

Of those received during the year, 95 were white males, 4 colored males, 1 Chinese male; total, 100. Ninety-three were committed on first, 6 on second, and 1 on third commitment: total, 100.

The largest number of convicts during the year was 222, and the smallest number 186, making a daily average of 207 prisoners, as against 197 in the year 1897.

DISCIPLINE.

I am gratified to be able to report to you that the discipline in this institution leaves nothing to be desired. The convicts work well and cheerfully at the tasks assigned to them, and what an amount of work they have performed during the past year is too well known to you and requires no mention.

In enforcing discipline in this prison, all officers and employes are taught never to lose sight of the fact that the penitentiary is not only for the punishment of law-breakers, but also an institution which should endeavor to reform the lawbreaker if possible.

SANITARY.

The sanitary condition of the New Mexico Penitentiary, as you yourself know, from frequent personal inspection, is excellent. The percentage of sick during the year has been about 3 per cent. Two deaths occurred in that period, to wit: Convict No. 710, Pedro Baca, died October 15, 1897, of heart failure, and convict No. 1004, Bill Hays, died February 11, 1898, of pneumonia.

MORAL AND RELIGIOUS INSTRUCTIONS.

Divine services have been, I am sorry to say, very much neglected, owing partly to the fact that the last legislature refused to make a small appropriation for a penitentiary chaplain, and partly to the employment of a large number of convicts at the rebuilding of the capitol every Saturday afternoon. These men return to the penitentiary from their work too late to be bathed, shaved, and cleansed, and as this has to be done every Sunday morning, divine service has to be omitted. Thus, for some time past, no religious services have been held at the penitentiary, except those of the Christian Endeavor Society, a small body of convicts, who worship for an hour every Sunday afternoon.

EMPLOYMENT.

Referring to the subject, I beg to quote from my report to the governor of the Territory for the year 1895: "During the year under consideration (1897-98) the convicts did not only earn their maintenance, but earned in territorial work, over and above it, 8.19 cents each per day. These earnings will be considerably increased at the end of this year. However, the question of finance in prison management should only be looked upon as subsidiary, and I must therefore be pardoned when pointing with pride to the principle which, as above stated, has been crowned with beneficial results.

In conclusion, I beg to state that the cost of maintaining your convicts during the past year (1897-98) has been slightly higher than during the preceding year, owing to higher prices paid for subsistence and clothing. The cost of maintaining the convicts for the year 1897 was 49.7 cents per man per day, and for the year 1898 50.6 cents per man per day, which amount properly apportioned reads as follows:

	Cents.
Salaries for all officers, employees, commissioners, medical attendance, etc..	\$33. 01
Subsistence.....	12. 85
Clothing	4. 20
Total.....	50. 06

As against 49.7 cents during the last year.

I have the honor to be, sir, very respectfully, your obedient servant,

E. H. BERGMANN, *Superintendent.*

His Excellency MIGUEL A. OTERO,
Governor of New Mexico, Santa Fe, N. Mex.

COUNTIES.

There are now eighteen counties in the Territory of New Mexico, located as follows:

NORTHERN TIER.

Colfax; county seat, Springer. Taos; county seat, Taos. Rio Arriba; county seat, Tierra Amarilla. San Juan; county seat, Aztec. Union; county seat, Clayton.

CENTRAL GROUP.

Mora; county seat, Mora. San Miguel; county seat, Las Vegas. Santa Fe; county seat, Santa Fe. Bernalillo; county seat, Albuquerque. Valencia; county seat, Los Lunas. Socorro; county seat, Socorro. Sierra; county seat, Hillsboro. Guadalupe, county seat, Puerto de Luna.

SOUTHERN TIER.

Lincoln; county seat, Lincoln. Donna Ana; county seat, Las Cruces. Grant; county seat, Silver City. Eddy; county seat, Eddy. Chaves; county seat, Roswell.

BERNALILLO COUNTY.

Bernalillo is one of the central counties of New Mexico. It is of very irregular shape, but will average about 70 miles from north to south and 150 miles from east to west, giving it an area of about 10,000 square miles, being a little larger than the State of New Hampshire. It is noticeable for the great variety of its natural resources, which afford ample foundations for the successful prosecution of all the leading industries of the country—agriculture, horticulture, grazing, mining, manufacturing, and lumbering. Of the precious and baser metals, gold, silver, copper, and lead are successfully mined at a number of different points in the county. The coal deposits are extensive and prac-

tically inexhaustible. In the north central portion of the county veins of bituminous coal of the finest quality, measuring 25 feet in thickness, have been explored, but for the want of facilities of transportation these have never been worked except in a small and ineffective way to obtain a few tons for local consumption. In the same section of the county is found the largest sulphur deposit known on the continent, being literally a mountain of sulphur rock, averaging 2,000 feet high and extending up and down the Jemez River Canyon for a distance of more than 18 miles. The rock yields 50 per cent of its weight in pure sulphur, but the deposit has never been worked except in a very small way, for the purpose of testing it, because of the same difficulty mentioned in connection with the coal measures of that section, i. e., lack of transportation, there being no railway line nearer than 60 miles, and the country being too rugged for successful wagoning.

Another extensive coal field exists in the western part of the county. This is a semibituminous lignite, burning remarkably free and leaving but little more ash than wood. It is mined extensively for railroad, commercial, and domestic purposes. The Santa Fe Pacific Railway obtains the fuel supply for its entire line from these fields, as does also the California Southern. It is shipped for commercial and domestic purposes east to Albuquerque, west to Los Angeles, and throughout southern California and southwest into Arizona as far as Tucson. The annual output of the mines is at present nearly half a million tons, and the companies operating the mines disburse more than a quarter of a million a year in wages.

The railway system of the county consists of the main line of the Atchison, Topeka and Santa Fe, which enters the county on the northeast and runs diagonally across into Valencia County, a distance of 50 miles, and the Santa Fe Pacific, which starts from Albuquerque and runs west to the line of the Territory, going for about one-fourth of the distance in Bernalillo County, and thus giving the county about 100 miles of railway.

The agriculture of the county is greatly diversified by reason of the fact that in all sections the surface is divided into mountainous, tableland and valleys, with a great variety of climatic conditions. The soil is nearly everywhere rich and productive. In most of the mountain districts farming, gardening, and fruit growing are carried on successfully without irrigation, and crop failures, for want of rain or from an excess of moisture, are no more frequent than in any of the agricultural States. On the tablelands or mesas crops can not be grown without irrigation, and farming is done on these lands only in a few localities because of the difficulty of securing a reliable water supply. The soil is strong and rich, being formed sometimes to the depth of hundreds of feet of the diluvial detritus from the granite, lime, and porphyry of the neighboring mountains, and hence practically inexhaustible, though its fertility is generally improved by the application of a little vegetable matter.

The principal part of the agricultural industry of the county, however, is carried on in the valleys of the streams, the chief of these being the Rio Grande, which enters the county from the east, near the north line, and flows thence diagonally across it at its widest part. Here is produced nearly everything that is grown in the north temperate zone, and the yield per acre of all kinds of products is usually much greater than from land in those countries where farming is done without irrigation, because the cultivator can always put on the water when it is needed, and withhold it whenever there is enough, so that his crop is never

injured either by drought or excessive rainfall, and if he does not get a maximum yield every year, it will be due to a lack of attention on his own part. Wheat, corn, oats, rye, barley, sorghum, and broom corn all grow to perfection in this portion of the county, and the grain yield per acre is much greater than the average in the agricultural States. In Kansas, which is one of the great wheat-growing States, the average yield per acre, as shown by the official report, is but 13 bushels. The average yield per acre in the Rio Grande Valley is 34 bushels, while a 50-bushel field is not by any means unusual. Indian corn also grows to perfection, and the long season enables the farmers to plant the largest southern varieties without any fear of the frost taking it before it is ripe. All kinds of vegetables and fruits grow well in this and other valleys of the county. The farmers and gardeners receive high prices for everything they raise, because there is a demand at home for more than they can produce. At present only a comparatively small part of the land of the valley is under cultivation. The system of irrigation that is in use is the same that was established by the first settlers of the country several centuries ago, and is not adequate to the demands of the present time. It is very wasteful and inefficient, and as soon as modern methods shall have been introduced, the area of land under cultivation can be increased almost, if not quite, 100 per cent without taking any more water from the river than is taken out at the present time. This will serve to furnish homes to a large number of new citizens in one of the most desirable and productive sections of the county, and will indirectly be of great benefit to the entire Territory, because it will serve to keep at home and in circulation among our own people very large sums of money that are now annually sent abroad to pay for articles that might be produced at home.

The cultivation of alfalfa was introduced about twenty years ago, and this plant now constitutes the chief forage crop of the county. The area under cultivation is increasing every year, and though the quantity of hay now made from it is not yet sufficient to meet the home demand, the amount of fodder necessary to be shipped into the county has been reduced in the course of fifteen years about 90 per cent, and it will not be many years, at the present rate of progress, before the county will be able to supply all its own demands in this regard and have some to sell.

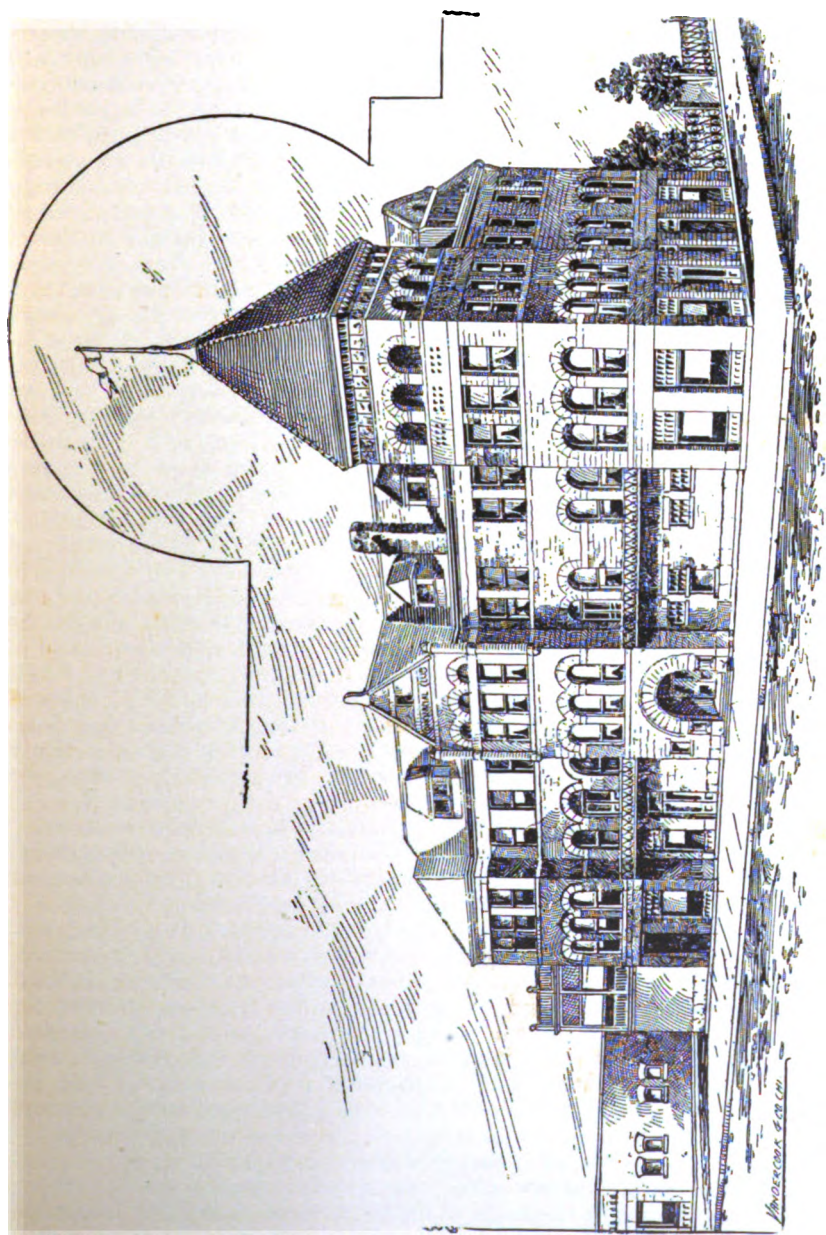
Among the well-known mining districts in Bernalillo County may be named Cochiti, Hell Canyon, Cayote Canyon, Tijeras, Las Placitas, and Copper City, in all of which there are mines of well-established value. The Copper City and Tijeras districts have turned out vast quantities of the richest copper ores ever mined in the Territory; Cayote Canyon and Las Placitas have large veins of low-grade ores carrying gold and silver, but as yet the properties have not fallen into the hands of men with sufficient capital to properly develop them. Hell Canyon is a producing camp, and has several valuable mines. There is a small placer field at the mouth of the canyon that is unusually rich, but it is unfortunately tied up by legal complications, and no work is being done upon it. A stamp mill, the property of the company that owns one of the mines, is running steadily upon the company's ores, and the results are very satisfactory. But the most important district in the county, if not, indeed, in the Territory, is Cochiti, situated in the Valles Mountains, about 40 miles from Albuquerque, in a northeast direction. The Cochiti country is one of the most remarkable mineral fields on the continent, and mining experts who have been over the ground are unanimous in the opinion that the deposits of the precious metals in

this vicinity are greater in volume and value than any that have ever yet been discovered in any other section of New Mexico. The district lies directly in the line of the rich gold belt that stretches through Cripple Creek, in Colorado, the Red River district, in the north of this Territory, and White Oaks, in the south central portion. The country bears upon its surface all the outward evidence of a mineral field, and this fact, together with the one just above mentioned, convinced experienced prospectors many years ago that the precious metals were here, and they were consequently sought for long and diligently, but it was only of comparative recent date that the first discoveries were made that laid the foundation for the present large and flourishing camps.

Cochiti has been known to the public as a mineral district only since 1893, as it was in that year that the discoveries were made that caused public attention to be turned in that direction. There are no "placer diggings" in the district, and the veins, though of immense size, carry ore which is of comparatively low grade. Very little of it is free milling, and nearly all of it requires to be smelted or to be treated by processes especially adapted to itself. These conditions, while not militating in any degree against the permanent character of the producing capabilities of the great leads there discovered, made it apparent at once, to all experienced men, that capital in considerable amounts was required to transform these marvelous veins into paying mines; and to induce the owners of money to invest it in a new and unknown mining district is a very difficult task. But this has at last been accomplished in the case of Cochiti, and some of the largest and finest mining machinery in the Southwest is now in active operation in that camp. Broad heavy veins of ores carrying moderate values, like those of Cochiti, not only make the most reliable mines, and in the end far the most profitable to the owners, but mines which are also of infinitely greater value to the country than the "big bonanzas," which yield fabulous wealth from a few "pockets," and then "pinch out." Veins like those at Cochiti can be worked upon just as reliable a basis as coal mines, and without any greater per cent of risk and uncertainty than attaches to any ordinary line of business. The element of chance is reduced to the minimum, and the company can calculate with almost mathematical accuracy how much profit can be realized from the outlay of a given amount of money. The veins run with remarkable regularity in volume and value. The manager knows all the time just how much ore a given number of men can turn out, and how much it costs to place his ore on the dump. He knows also, with practical certainty, just how much value each ton will yield. There is nothing in it that depends on "luck," or the chance of striking a "pocket," but the working of these broad veins is a straight business proposition; and now that capital has come to realize the actual value and permanent character of the vast mineral deposits of Cochiti, it will be but a comparatively short time till that district will take rank as one of the most prosperous and populous camps of New Mexico, and one that will contribute greatly to the prosperity of all the surrounding country.

There are four prominent towns in Bernalillo County, namely: Albuquerque, Gallup, Bland, and Bernalillo.

Albuquerque is the largest town in New Mexico and has a population of about 12,000. It is incorporated under the simple and efficient Territorial law for the government of cities; its municipal affairs are managed in a satisfactory manner, without useless or expensive machinery, and it thus has good government with low taxes. It has 25 miles of well-graded streets and about 50 miles of sidewalks; it has a thorough



COMMERCIAL CLUB, ALBUQUERQUE.

system of underground sewers, and the sewerage is discharged into the river a mile below town; it is lighted by gas and electricity; has water works and a good fire department; street cars and good hotels; two daily newspapers, four weekly papers; a free public library, and a modern public-school system. Numerous resorts in the mountains adjacent to the town are a source of never-ending interest and enjoyment to visitors and residents during the summer, and may be reached by drives of from one to three hours over the finest of natural roads, presenting scenery that is not excelled in any part of the Southwest. The important manufacturing plants of the town include three flouring mills, an ice factory, two foundries, railroad machine shops, and a brewery, employing together about 550 men; and in addition to the important establishments named, there are a score of smaller works, employing from two to six men each. There are openings for canning factories, fruit-drying establishments, and many other smaller manufacturing industries, with a ready market for their products.

The public institutions of Albuquerque include the Territorial University of New Mexico, United States Indian School, Methodist College, Southwestern Academy of the New West Education Commission, St. Vincent's (Catholic) Academy, St. Mary's (Catholic) Parochial School, four fine public-school buildings, eleven churches, a free public library, two daily newspapers, and the Commercial Club, a literary, social, and business organization, conducted in the interest of the public, and which owns and occupies one of the finest and most costly buildings in New Mexico. Albuquerque is the trade center of a vast area of rich and productive country—an area greater than that of the six New England States and New York combined—and though the agricultural products of this area are not as great in volume as those of a like district in the agricultural sections of the country, its products in gold, silver, copper, lead, coal, lumber, cattle, and sheep are enormous, and as they chiefly find their way to market through this place, and those engaged in these lines do their banking business here, it will be seen that here is an ample foundation upon which to build a city much larger than any that now exists between the Missouri River and Los Angeles.

The sheep and wool products of New Mexico alone have brought into the Territory during the year of 1898 a sum of money sufficient to give about \$24 a head to every man, woman, and child of the total population, and as at least one-third of all these products are handled in Albuquerque or through Albuquerque dealers, it will readily be seen that this of itself furnishes a good commercial foundation for a place much larger than the present town.

But sheep and wool constitute only one item of the products of the country. The mining business is probably bringing in at present as much money as the sheep business, and it is also developing very rapidly, and will become in a few years, if it is not already, the leading industry of the Territory. And this line of business, like the other, has its center at Albuquerque, and mine operators, even in some of the most remote parts, pay their men and carry out all their transactions with checks on Albuquerque banks. And the proportion of the total business in both of these lines which is transacted here is very rapidly increasing every year.

Next to Albuquerque, in point of population, is Gallup, the most important coal-mining point in the Southwest. Gallup and Albuquerque are farther apart than Boston and New York, yet they are both in the same county and regard each other as "next door neighbors." Gallup is

a place of about 2,000 people, and is the largest town on the line of the Santa Fe Pacific road west of Albuquerque. It is well equipped with schools, churches, and places of public entertainment, and has a good weekly newspaper. It has a number of fine business blocks, occupied by wide-awake, enterprising merchants, and its coal mines furnish steady employment to about 700 men.

The extent to which the coal-mining industry, of which Gallup is the center, may be developed is practically unlimited. What has been done thus far is only a beginning—it is merely as “a drop in the bucket” compared with what can be, and doubtless what will be, accomplished in the not very far distant future, and yet the very little that has been done up to this time furnishes the great railway line from Albuquerque to Los Angeles with its most important item of local traffic.

The vast coal field of which Gallup is the shipping point has only been partially and superficially explored. How much greater and more vast may be the deposits to be found in that district by future explorers we may not at present even hazard a guess, but a very good idea of the value and permanency of the resources upon which the town of Gallup depends for its prosperity may be gathered from the fact that even the little that is now known of the extent and volume of the coal deposits of that district is sufficient to show that were the present output doubled, or even quadrupled, centuries must elapse before there will be any visible diminution of the supply.

The town of Bland, in the Cochiti mining district, has been growing more rapidly during the last year than any other town in the county, and now ranks next to Gallup. It has at present about 1,200 people, all of whom depend directly or indirectly upon the mines of the district. It has a good public school, an excellent weekly newspaper, a live and wide-awake population, and is in all respects a typical American mining town, brim full of enterprise and pluck.

Bernalillo, which was at one time the big town of the county, has been overtaken by three of its younger rivals, and now ranks fourth in point of size. It is delightfully situated on the Rio Grande, at the north end of the Sandia range, and is a beautiful, home-like place. It does a large business in wool, grapes, fruits, and wine, and its people represent a large portion of the wealth of the county.

In addition to the towns named, there are a number of large villages in Bernalillo county, prominent among which may be mentioned Los Corrales, Pajarita, Atrisco, Casa Salazar, Las Placitas, Chilili, and Nacimiento. Their people depend almost entirely upon agriculture and woolgrowing, and are generally prosperous and contented.

RESOURCES OF CHAVES COUNTY.

Chaves County is the second largest county in New Mexico in its number of acres. In its area of arable and irrigable lands it is by a large per cent the first county in the Territory. It contains 6,554,000 acres. The average altitude of the county is about 3,800 feet. It is about six times the size of the State of Delaware, and it is capable of producing far more than six times as much human food as that notable State of gardens and orchards.

The eastern part of the county, lying beyond the Pecos River, is a very fine natural grass country and sustains large flocks of cattle, but it is beyond the limits of irrigation, except in small areas from springs and from wells by steam or wind power. The western part of the county extends from the Pecos across the broad plains which reach the foot-

hills, which average about 20 miles distant. The high rolling lands on the west line of the foothill region are admirable grass lands, which embrace many small valleys where water can be stored for irrigation purposes and small farms can be established.

The very rich country lying between the foothills and the Pecos is one of the most valuable tracts of land in America. Its soil is a brown chocolate loam of great depth, and is inexhaustibly rich in all the mineral elements that render farms permanently fertile. Nearly all of this region is situated very favorably for irrigation, both in its topographical features and in the possibility of a sufficient water supply. All this region slopes gently to the east, and with its broad easy swells and almost level areas it lies most invitingly for the irrigator. This district embraces about 250,000 acres.

WATER SUPPLY.

The available water supply is in three forms:

First. The very large springs in the neighborhood of Roswell, which are from 5 to 8 miles west of the Pecos. Their united flow is from 15,000,000 to 20,000,000 cubic feet of water every twenty-four hours. This water is much used for irrigating the contiguous farms. With a more economical use of water these springs will be able to supply as much as 100,000 acres with an abundance of water for all kinds of agricultural crops.

Second. The artesian wells which can be had in this district, which lies immediately below the level of the big springs. These wells strike a perpetual flow of water at a depth of from 150 to 400 feet. There are now about 100 of them in operation, and they add substantially to the water supply of this immediate district. The yield of water is from 20 to 60 cubic feet of water per minute, or from 25,000 to 75,000 cubic feet of water per day. Each of these wells is capable, when the water is fully utilized by storage and careful distribution, of irrigating from 100 to 3.0 acres of farming land. The possible supply of artesian water within the district described is far in excess of the demand of the land within its immediate scope, and can be used by properly located canals to water a large area lower down the valley, in the south part of this county and in Eddy County. There are approximately 50,000 acres of land in this county lying "under" the artesian system, when good engineering has fully utilized this great natural supply. At present this wonderful resource has been but crudely and wastefully developed. As we have seen, the quantity of water available is sufficient when properly handled to cover an equally large tract of fine land in the next county below us.

Third. The storage reservoirs, which are easily built, and have an abundant water supply to fill them. About 200,000 acres of this fine rich tillable land lies above all possible natural spring or artesian-well irrigation, and must depend upon waters to be stored in reservoirs yet to be constructed. This matter has never been seriously taken up by the citizens and landowners, but plans are now made for storing the vast volume of water that annually comes down from the White and El Capitan ranges of mountains and their foothills in Lincoln County, and goes in great floods to the Pecos and the Rio Grande, giving no service to man, but often doing much harm by inundating the lower valleys. There are several excellent reservoir sites that have been surveyed, mapped, and entered upon, and it is expected that construction will be commenced within the current year. When these great reservoirs are

built—and they will be larger than any now made in the United States—an abundance of water will be stored to put all of the great tract above described into a high state of cultivation. This reservoir proposition is entirely practicable, both in the easy topography of the sites and in the abundance of storm waters which go to waste from a drainage district covering more than 2,000,000 acres of hill and mountain country. When it is carried out and all the lands in the county which are subject to irrigation are brought under its transforming influence then this irrigation district of Chaves County will be capable of producing a greater tonnage of important agricultural and horticultural crops than any equal acre of the United States.

The large claim made in the above paragraph may seem extravagant to people not familiar with the yields of crops from rich land under well-managed irrigation. All the great agricultural States are subject to immense crop losses both from excessive rainfall and from prolonged droughts. No farmer in the country depending wholly on rainfall is ever sure of a crop that is proportioned to the skill and labor given to it. The energetic, up-to-date farmer may get a maximum crop; he may get a half crop; he may get a failure. An equally industrious and brainy farmer in Chaves County who has good land, a moderate rainfall, exemption from destructive floods, and a complete command of an irrigation supply of water, will get maximum crops every year. Hence the boldness with which this claim is made.

WHAT OUR STAPLE CROPS WILL BE.

Live stock.—We mean live stock of all kinds—cattle, sheep, hogs, mules, and horses—bred and grown on farms, inside of pasture fences, with abundance of food every day in the year and a perennial supply of water. The great yields of alfalfa and other grasses which are adapted to make rapid animal growth in the “rich Roswell Country” have been for years a surprise to all visitors from the old States. The experience of our most intelligent farmers shows that as much as 2 head of cows, steers, horses, or mules can be kept in a thrifty, growing condition on each acre of alfalfa land for the entire year. The best farmers of Kansas, Illinois, Ohio, or Kentucky say that in these States it takes 2 acres of land to carry one animal through the entire year. This statement is intended to be conservative, and it shows a difference of four to one in favor of the Roswell irrigation country. With sheep and hogs, from 10 to 20 head to the acre can be carried through the year. The statements are intended to cover the growing of these animals up to maturity, but not to embrace their fattening or “finishing off.” For the fattening period this region will not possess the same proportional advantage. We can fatten all the beef, pork, and mutton here all right on corn, Kaffir corn, milo maize, etc., grown right here and not in Kansas, but we can not grow four times as much grain to the acre here as they can in the rain-belt States, yet we can grow larger average crops of these grains in ten-year periods than any State can show without irrigation advantages.

The future of this region as a producer of meats at a very low cost, and hence at a large profit, seems assured. The attention of farmers has been turned to this question for but a few years. Roswell is headquarters for an extended cattle and sheep interest conducted upon the open-range plan. Stock farming upon the eastern plan is a very different industry, and has not until recently attracted the consideration of our enterprising cattle companies. But much thought is now being

given to the matter, and there is promise of a great development along this line.

The area of land that can be put into meat production, under one or all of the irrigation systems, is large enough to support an industry of magnificent proportions. Beyond a doubt the majority of this land will be ultimately used to increase the meat supply of the world. There are many reasons for this. This is one of the healthiest regions for live stock of all kinds on the globe. We have none of the diseases that are so fatal to cattle, hogs, or sheep in humid climates. Our altitude above sea level, our thorough surface drainage, our semiarid climate, and our proximity to the Rocky Mountains, combine to give us a climate of exceptional salubrity for both men and animals. The thorough farm manager will be able to raise 99 per cent of the stock born in his fields to full maturity. The length of season in which stock live in our pastures without any need of prepared feed, taken in connection with the immense yield of these pastures, will always make the actual cost of meat products a very low one. The extremely small risk, the very light labor in providing cured foods, together with the certainty of an unlimited demand for our meats at fair prices, with comparatively slight fluctuations, will altogether make this branch of farming attractive to the large majority of men.

Suppose as much as 150,000 acres of the area described as capable of irrigation should be put into meat-producing industries, what would be a conservative estimate of the yield of this area in these products? Our swine growers will certainly claim ability to grow 10 pigs to the acre yearly that will weigh 200 pounds each, live weight. The most pessimistic farmer would not reckon this crop as low as 1,000 pounds of live hog to the acre. But at that very safe figure, an aggregate of hog farms equal to two and one-half townships of this district would give an annual output of 50,000,000 pounds of hogs. In a region where hogs are never decimated by disease, and where they breed and grow with so little cost to the farmer, it is by no means a chimerical expectation that such an industry may be built up. The sheep breeders will claim an equal facility and equal profit in producing mutton and wool.

But the great meat of the world is beef. The beef supply is never large enough to meet the world's demand. The area for beef production can not be greatly extended in the United States, at least not enough to equal the constantly increasing demand. The foreign demand for our beef and beef products is growing year by year. The population and wealth of the civilized nations—the nations that eat beef—is growing somewhat rapidly. The agricultural situation of the beef-producing countries of the world shows that the volume of production is not likely to keep pace with the magnitude of the demand; hence the prices of beef will never for any long period diminish, but will beyond question increase. This insures a steady and profitable market for this staple meat of the world for all future time.

We are in this county very fortunately situated for sending our crops—especially meat crops—to the large markets of the world. We shall soon be in direct communication with Kansas City and Chicago and all the great interior cities. We are but about 800 miles from Galveston. Our beef and pork and mutton will ere many years pass be slaughtered here, shipped under refrigeration to Galveston, and thence in refrigerator ships to London and the continental cities of Europe. This will surely follow the establishment of large meat-producing ranches, according to the inevitable working of commercial laws. We are nearer to an exporting point than Kansas Iowa, or Illinois. We can produce and

fatten the highest quality of beef and pork and mutton at a cost of about one-third the amount it will cost the farmer in these States. We can place our products in the best markets of the world at an equal expense. If this be so, is there not a bright future for the grower of meats on the irrigated lands of Chaves County? Is it a wild calculation to suppose that the chances to produce these crops under such unusual advantages will be fully improved and at least 150,000 acres of these rich lands be put to this use? If this is to be so, then an annual yield of 150,000,000 pounds of meat products for this county is a by no means extravagant expectation.

Orchards and vineyards.—The horticultural capabilities of Chaves County are not well proven, but only indicated by the very limited experiments in that line, excepting only for apples. There is no vineyard of importance in the county. The few dozens of vines planted in gardens are usually in soils least adapted to their success. Grapes require high, dry, open lands, with thorough drainage. Peaches require a similar soil and a situation above surrounding land, where there is good cold-air drainage in the spring. But the few peach trees planted here have been on land too low and too rich, hence occasional failures of crops must not be taken to discredit this district for those cultures. There are numerous gravelly ridges and slopes lying up near the foothills, amounting to many thousands of acres, that are not well adapted to farm crops, but which it is believed are particularly adapted to produce reasonably sure crops of grapes, peaches, and cherries. The color and quality of these fruits on these high lands will be superior to what can be grown on the richer plains, and the crops will be far surer. There is from 25,000 to 50,000 acres of this class of land in this county that should some time be famous for its vineyards and peach orchards. We can grow both the European or California class of grapes, and all the American varieties. We can grow a class of peaches here which are quite sure croppers, but which in the States rot so badly that they are not profitable. We need never have peach rot or grape rot in this climate. We shall be free from destructive diseases which attack orchards and vineyards at the East. For these crops we have the advantage of California, with the great additional one of proximity to the important markets of the center of the continent and of the entire South, hence it is believed that peach and grape culture will in time be established here on a large scale.

For the production of apples and all of the pears and plums that bloom late in the season, it is believed that Chaves County has advantages that outweigh those of any other section of the United States. Enough has been done in apples to demonstrate our great superiority. The writer has seen and studied apples from every apple-producing region of the globe, but has never seen as perfect, handsome, and excellent apples grown in any country as we have grown near Roswell during the last four years. The high color, symmetrical form, and polished, waxen purity of the skin of our apples, as they grow on the trees and before they are bruised and spoiled by the common apple handler, combined as it is with the perfection of flavor in the given varieties, is something we do not find elsewhere. When we add to this the fact that the trees are exceptionally free from all diseases of leaf and limb and from all accidents except the occasional one of hail and the pretty general one of damage by the ignorant tree pruner, and that crops are more sure than perhaps in any other apple-growing section of America, we see reason to believe that apple growing will become among the most important of our industries. In fact, it should rank next to the growing of meats.

An apple tree in full bearing will yield an average of 10 bushels to the tree. There should be 120 trees planted on an acre. These can grow until the orchard has yielded many such crops of 10 bushels to the tree. At some time in the future a portion of these trees may require removal, but we need not now consider that contingency. We may expect a first-class apple orchard to yield 1,000 bushels of apples to the acre, taking an average of the years. What should we see if the 1,500 acres of apple orchard now growing in the county should by and by grow to be 50,000 acres? Why, possible crops of 50,000,000 bushels of apples if every man did his best! It may seem that this would be an impracticable and unmarketable crop, but statistics of production and consumption do not point that way. It is very rare that there is a general apple crop in the United States. About every other year prices run very high. America is its own best apple market, but it has to produce all of the highest grade apples used in the whole world. For this great world's fruit, as-for cotton and corn, America must supply the civilized nations. The old apple States are suffering from a multitude of diseases which we are free from. The "Star of Empire" in apple production is moving rapidly westward. We are nearer to a good exporting point than any Western State. Then why should we not plan to reap our manifold, nature-given advantages, and make Chaves County the crowning apple region of the world?

RAILROAD FACILITIES.

The Pecos Valley Railway runs from Roswell south to Pecos, where it connects us with El Paso and Mexico and California on the west, and with Fort Worth, Dallas, Galveston, New Orleans, and St. Louis to the eastward. The extension of this railway to Amarillo, 200 miles, which is now actively building at both ends and will be completed by January, 1899, will connect us directly with Denver, Kansas City, and Chicago. The proposed railroad to the coal fields in Lincoln County will be but 75 miles long and will soon be built. This will give us cheap and excellent coal and easy access to the mineral region and the cool summer climate of the White Mountains. A road running from Roswell to Albuquerque and another from Roswell to Fort Worth direct would, with their connections, constitute the shortest and most desirable line between San Francisco and the cities of the Gulf. This line is being seriously considered, and all natural and commercial reasons favor its construction in the not remote future. The orthodox Roswell man believes his town will become an important railway center within the next decade. The shops, roundhouses, and official headquarters of the Pecos Valley Railway and of the Pecos Valley and Northeastern are to be established in Roswell during the current year. This is fixed by definite contract with those companies.

BUSINESS DATA.

The lands in Chaves County entered and held by private owners slightly exceed 130,000 acres. Of this amount 4,850 acres are seeded to alfalfa, and are now yielding abundant pasturage and hay crops. This is but the beginning of a vast development of this interest which will rapidly follow, for it has become a recognized agricultural fact that alfalfa far surpasses all forage plants in its capacity to support animal growth. The soil of Chaves County is preeminently adapted to this plant. The great extension of the live-stock interests of the southwest that is coming in the immediate future will mainly be based on alfalfa.

The acreage in orchards is now about 1,500, and is mainly in winter

apples. These orchards are nearly all young and are just coming into bearing.

There are something over 120,000 cattle owned in the county and 150,000 sheep. Great attention is now being given to improving the breeds of both cattle and sheep. Several large farms are now devoted mainly to breeding the best beef breeds of cattle. This enterprise has had unqualified success from the start and will grow into large proportions, as, for the reasons given above, no stock-breeding section of the States has so many advantages for this industry.

Roswell is to be the center of the sheep industry and of the wool-handling interests for the southeastern part of the Territory. Large amounts of capital have been invested in sheep in this county within the past few months. The largest flock master in the region west of the Missouri River has purchased extensive interests here. Wool-scouring establishments are likely to be built at an early date. As we are nearer to Kansas City than any other important shipping point in New Mexico, all the facts of the present situation point to Roswell becoming the metropolis of the sheep industries of the Southwest.

The shipments of wool from Roswell for the year 1898 will be about 1,000,000 pounds. The great herds of range cattle that have in former years been driven across the plains to connect with the Kansas railways will henceforth be shipped direct from Roswell, and can reach Kansas City in twenty-four hours without unloading. This will be the shipping point for the cattle from Lincoln County and a large portion of Eddy County. But the volume of this traffic that can come from the open range from these three counties will be greatly exceeded by the yield of the farms that will be created in the irrigable district of Chaves County alone when the different systems of water supply herein outlined have been fully developed.

Roswell is a trade center of considerable present importance, with an assured growth in the future. Our mercantile sales exceeded \$400,000 in 1897, and will pass the half-million mark in the current year.

EDUCATIONAL ADVANTAGES.

Roswell has been noted for its interest in public schools. In addition to its excellent graded system, with two brick school buildings erected at a cost of \$7,500, it now has a seminary of the higher class established here. This is the New Mexico Military Institute, which will commence its first session in September of this year in its new and imposing brick building, which has been erected on the bluff north of town. This institution, with its equipment for high-grade teaching, will, with other schools being planned, make Roswell an important educational center. The climate of this region distinctly favors this. Our summers are cool and our winters are temperate and delightful.

To recapitulate the advantages and resources of the county, it may be stated briefly that the foundation of the present and future prosperity of the county is agriculture. Successful agriculture is based on good land and a cheap and reliable water supply. Chaves County has a greater area of rich land that can be irrigated than any county of the Territory or in the entire Southwest. It can be irrigated because there is a sufficient water supply within easy reach, at a low cost, to fertilize every acre of the arable area above described. Hence we have a larger natural capacity for producing staple crops than any competing section.

The people of Chaves County feel that they are in the morning of a glorious day. They are in a strong and hopeful mood, and are ready to keep step with the procession in which our "New America" travels forward to its magnificent destiny.

COLFAX COUNTY.

Colfax County is in the northeastern portion of New Mexico, next to the southern line of Colorado; is 72 miles long from east to west and 54 miles wide from north to south. Its area is 3,888 square miles, or 2,488,320 acres. Of this area 2,300 square miles are included in the famous Maxwell land grant, the title to which has been long since settled. Much of this land has been sold and is now owned by ranchmen and farmers. The remaining land in the county mostly remains a part of the public domain, only a comparatively small portion having been taken up by settlers.

The central and southeastern part of the county is rolling prairie and valley land, well watered by permanent streams, springs, and lakes, and is specially suitable for stock raising and farming.

The western and northern portions are mountainous, being low-lying, well-sheltered foothills and valleys, backed by a high mountain range. In this mountain range, which is a spur of the Rocky Mountains, a number of permanent streams have their source, all flowing to the southeast, furnishing water for the fertile valleys and prairies.

The altitude varies from 5,600 feet in the southeastern part of the county to about 7,000 in the foothill valleys and up to 13,000 feet on the mountains. The general slope of the country being to the southeast, the cold storms from the north are broken against the mountains, so that cyclones and blizzards, such as sweep over the open plains to the north and east, are unknown here. The average mean temperature for the year at an altitude of 6,000 feet is 51° F., being 34° for the three coldest months—December, January, and February, and 70° for the three warmest months—June, July, and August. The atmosphere is dry and extremes of heat or cold are not at any time disagreeable. The average annual rainfall is 15 to 18 inches at same altitude, 6,000 feet and over 30 inches in the high mountains. Much snow falls in the mountains, which melts gradually during the spring and early summer, furnishing a good supply of water for irrigation.

The days and nights are pleasantly cool in summer and comfortably warm in winter, and it is withal the most delightful all-the-year-round climate to be found anywhere in the world.

The following, from the Guide to the Maxwell Grant, aptly describes our climate:

The climate of the southeastern slopes of the Rocky Mountains, where the Maxwell land grant is situated, is beyond description beautiful. The air has, even in the dog days, a bright, effervescent crispness that defies the greatest efforts of the hot sun to make it sultry. The sun seems to shine through, not into, the air, and one is often surprised, when looking at the thermometer on some pleasant day, to find the mercury way up in the nineties. This peculiarity of never feeling uncomfortably warm, even with the mercury at that height, is accounted for by the extreme dryness of the atmosphere, the mean humidity being only 38 per cent. This causes a rapid evaporation of perspiration from the skin and a corresponding coolness of the surface. One never feels depressed as one does farther east and in Europe and at lower altitudes and in all other hot countries. After the hottest summer day a couple of blankets at night will always be required. As in summer one does not feel the dry heat, so in winter one does not feel the dry cold. Out of the wind and in the sun it is always warm; so much so, that the cold is not thought a drawback by the army of consumptives that flock to New Mexico as a sanitarium. It may be stated as absolute truth that we have no severe droughts, no fogs, no hot winds, no cyclones, tornadoes, or hurricanes, no northers, no winter rains, and it was no exaggeration when the Hon. L. Bradford Prince, then governor of New Mexico, in an address delivered in September, 1891, speaking of Colfax County, in which the Maxwell grant is located, said:

"When one views the verdant plains of eastern Colfax, covered with herds of cattle, changing to the west into the agricultural lands along the Vermejo, the Ponil,

and the Cimarron, dotted with the coal mines of Blossburg and the pine forests of Catskill, and rising into the golden mountains and gold-bearing streams of Elizabethtown, one is apt to say, 'This, truly, is the promised land.'

The people who reside here, as well as all domestic animals, are remarkably free from disease. There is something in the dry, pure air, possibly ozone, that is destructive to disease germs, and people spend much of their time out of doors the year round, which is always conducive to good health and a cheerful, happy existence.

The so-called rainy season, of about six weeks to two months, usually occurs in July and August, during which time showers fall almost daily, generally in the afternoon, the mornings being clear and bright. Then the whole country, from the green prairies and valleys up through the evergreen foothills covered with piñon, cedar, pine, and spruce timber, to the high mountains, upon whose lofty summits banks of snow can be seen, presents a landscape as lovely as the eye could wish to see.

In these mountains the scenery is grand beyond description. There are many clear, cold, rippling streams in which there are speckled trout, and on either side great forests of pine and spruce timber where the hunter can find deer, bear, wild turkeys, grouse, and other game. Many of the people spend several weeks each year in delightful camping parties in these mountains.

The wealth of Colfax County in mineral, agriculture, and timber lands, though still very much undeveloped, is very great, one mine alone having produced over \$1,000,000. The elevation of the table-lands ranges from 5,000 to 8,000 feet and the prairie land from 4,000 to 5,000 feet.

The principal incorporated city is Raton, having a population of over 3,500 people, composed chiefly of artisans and mechanics; it is also the county seat. The Atchison, Topeka and Santa Fe Railway Company has here its largest machine shops west of Topeka. The other important towns are Springer, Elizabethtown, Gardiner, Blossburg, Maxwell City, Catskill, and Cimarron; all doing a good business and thriving rapidly. The coke ovens at Gardiner, 2 miles west of Raton, are among the finest in the Rocky Mountain mining region. Coal sells from \$1.50 to \$2 per ton.

Catskill lies in the timber district, and seven sawmills are in operation the year round, giving employment to a large number of employees.

Elizabethtown and Cimarron are in the mining district, where a large number of paying mines are constantly in operation.

Near Maxwell City and Springer large irrigating ditches and reservoirs have been constructed and 50,000 acres of land placed under ditch. Farming has within the last few years progressed rapidly. Near Springer are several artesian wells, from which large tracts of land are irrigated, and the medicinal qualities of the water are unsurpassed, and large quantities of it are bottled and shipped to various parts of the country.

IRRIGATION AND WATER SUPPLY.

The rainfall of 15 to 18 inches annually, although a large portion of it falls during the summer season, is not sufficient to insure the growth and maturing of crops, and most of the farming is done under a system of irrigation.

While this system has some disadvantages, the farmer soon learns that the certainty of raising a crop every year, the convenience of being able to moisten and plow the ground when he wishes to without waiting for rain to fall or for floods to dry up, the certainty of

having pleasant weather for the harvest, and the fact that the waters used for irrigating constantly supply fertilizing matter to the soil, more than make up for the extra cost and trouble of irrigating.

During the spring and early summer the melting snows in the mountains fill the streams and usually furnish water enough, if it could be utilized, to irrigate all the land in the county. But during the month of June, and often part of May, the water in the streams is low, and in order to insure ample water supply at all times for large tracts of land it is necessary to save the water when it is plentiful in storage reservoirs. Fortunately there are many natural basins in the county where this can be done at little cost.

The Maxwell Land Grant Company owns two large irrigating systems with storage reservoirs. One takes the water from the Vermejo through 20 miles of main canals and distributes it from fourteen storage reservoirs through 40 miles of laterals.

The other, near Springer, gets its water from the Cimarron River, and consists of 26 miles of main canals, 20 miles of laterals, and a number of storage reservoirs, the largest covering 700 acres an average depth of 9 feet.

There are many smaller irrigating systems and ditches belonging to private individuals, and altogether about 60,000 acres are under ditch in the county.

Surveys have been made for a large storage reservoir in the Moreno Valley, at the upper end of the Cimarron Canyon. At this point a dam 100 feet long at the base, 230 feet long on top, and 100 feet high will make a reservoir covering 3,000 acres of land an average depth of over 30 feet, which will hold 30,000,000 gallons of water at one filling. The material for building the dam is immediately at hand in the rocky cliffs near by. The drainage area above this point, with numerous never-failing mountain streams, furnishes water enough each year to fill such a reservoir several times. This reservoir would supply water sufficient to irrigate 100,000 acres, and the total expense of the reservoir and canals necessary to distribute the water would not exceed \$2 per acre.

This is only one of the many enterprises awaiting development in this county.

There are thirty-nine school districts in the county, wherein school is taught from three to ten months in each year, and education is carried to every home, so that not a child in the county is in any way barred from the opportunities of a liberal education.

The county is bordered on the west by the ridge of the Sangre de Cristo range of mountains, and partially on the north by the Raton Mountains, which form almost a right angle, whose sides are 50 miles in length. The prairies are well watered by the Red, Vermejo, and Cimarron rivers, including the Rayado and many tributaries and smaller streams.

The cost of irrigable land varies from \$15 to \$30 per acre; this includes free use of water under perpetual lease.

The climate is mild and equable as all through New Mexico and offers a permanent cure to those afflicted with pulmonary complaints.

The Maxwell Land Grant Company, a corporation owning a very large portion of the land in the county, has constructed a perfect telephone system, connecting all important towns in the county.

RAILROADS.

There are two railroads in the county, the Atchison, Topeka and Santa Fe, which traverses the county from north to south, and a branch of the Union Pacific, which has recently been built into the timber district at the head of Red River.

AGRICULTURE.

In the higher mountain valleys and on the high mesas or table-lands in the northeastern part of the county, crops, particularly of wheat, oats, barley, hay, and potatoes, grow without irrigation. Johnson mesa, east of Raton, which until a few years ago was used only as grazing land for sheep and cattle, is now settled up by several hundred prosperous farmers. In the lower valleys and on the prairies crops of all kinds grow luxuriantly under irrigation. The principal crops are wheat, oats, barley, alfalfa (producing three good cuttings each year), sorghum, beans, peas, and all kinds of field and garden vegetables that can be grown anywhere in the temperate zone. The summer nights are too cool for corn except the early northern varieties.

Fruits, particularly apples, pears, plums, cherries, apricots, crab-apples, quinces, nectarines, berries, and the hardier kinds of peaches and grapes, are produced in abundance.

The fruit and trees are free from blight, and the fruits are remarkably crisp, juicy, and of pleasant flavor.

The crop is very certain, and no general failure of the fruit crop has occurred in the county for many years.

MINES.

Coal.—Colfax County contains approximately 1,000 square miles of coal land. The coal is a rich bituminous coal, being of the best for steam purposes and locomotives, and is a fine coking coal. It lies in horizontal beds or strata in the foothills, from 4 to 13 feet in thickness, and is easily mined by driving entries into the hills along the veins. The mines are dry, and neither hoisting nor pumping is necessary. The principal operated mines belong to the Raton Coal and Coke Company, at Blossburg, and they supply most of the coal to the railroads in New Mexico and northern Mexico. These mines have a present capacity of 1,500 tons per day. The company has a new, complete, modern electric plant for cutting and hauling out its coal, which largely increases the output. The same company also operates 76 coke ovens. These ovens are so constructed that the waste heat from the burning of the coal used in making coke passes under large boilers and furnishes the power for the electric railway, electric-light plant, pumping engines, and for other purposes.

This property is well worth a visit from those who wish to see an up-to-date coal mine in operation, and is only a half hour's drive from Raton.

There are also a number of smaller mines operated by individuals in different places in the county.

Choice domestic coal is sold at \$1.50 per ton in Blossburg, and at \$2 per ton in Raton.

Nut and slack coal for use under stationary boilers sells at about 50 cents per ton.

GOLD MINES.

In the mountains around Elizabethtown and Baldy, in the western part of the county, gold has been known to exist for many years, and many fortunes have been taken out of the rich placers in that vicinity. In 1866 quite a rush of miners went into the Moreno Valley. Elizabethtown had a population of about 3,000 people. A large ditch, 42 miles long, with many miles of wooden flume and iron pipe, was constructed to furnish water for hydraulic mining. These placers have been worked successfully ever since, but as the richest known diggings were worked out, many people left the camp with their fortunes made, or attracted by extravagant tales of rich "finds" in other localities.

These placers have produced several millions of dollars, and some new mining machinery now being put in for working the rich "flat placers" will greatly increase the production.

Quartz mines were discovered over twenty years ago; but as no quartz was considered of any value unless it showed free gold to the naked eye, only a few of the richest mines were worked. Of these the Aztec, near Baldy, produced \$21,000 in a single week with a 10 stamp mill, and altogether produced over \$1,000,000 through the same mill, although the deepest workings in the mine were only 300 feet below the surface.

The richest ores in the district are more or less refractory and require some other treatment than the old-fashioned amalgamating process heretofore used in the camp. This is now receiving the attention of intelligent mining men, and within a short time smelters, concentrators, and other improved methods will make this a thriving camp.

Recent rich discoveries have filled the mountains with prospectors, and hundreds of new mining claims have been staked out.

Ores of silver, copper, lead, and iron are found in abundance throughout the district.

The regulations recently adopted by the Maxwell Land Grant Company are very liberal, and under them a patent can be secured for a claim 1,500 feet by 300 at any time within two years from discovery at a total cost of about \$200.

Some recent discoveries of gold, silver, and copper ores in the Urracca and Bonito country, upon the lands of Francis Clutton and Harry Whigham, have caused quite a rush of prospectors to that locality, and these gentlemen offer the same terms to prospectors as the Maxwell Land Grant Company.

Several railroad companies have extended their surveys into this mining country, and some of them will probably soon be building in that direction.

At present the nearest railroad point to the mines is Springer, on the Atchison, Topeka, and Santa Fe Railway, from which place the trip to the mines is made by stage in one day over good roads through the Cimarron Canyon and a beautiful mountain country.

The other mineral resources are varied. There are deposits of plumbago and fire clay, as yet unworked.

Near Springer there are extensive deposits of natural cement plaster now being opened up, and also large quarries of cement rock which produces a natural hydraulic cement.

Petroleum is found in the rocks a few miles west of Springer, though no wells have been sunk.

There are two good flowing artesian wells near Springer, one of which belonging to Mr. John C. Taylor furnishes a mineral water possessing

valuable medicinal properties and is a pleasant table water. The water is bottled and shipped to the towns and cities along the Atchafalaya, Topeka and Santa Fe Railway. The geological formation is such that artesian water may be confidently expected at depths of from 1,200 feet all over the prairie portion of the county.

STOCK RAISING.

Colfax County is an ideal stock-raising country. It is cool enough so that all animals grow to proper size, yet warm enough in winter that cattle, sheep, and horses require no artificial shelter and little food beside the nutritious natural grasses which cure on the ground.

Until a few years ago this county was the home of large herds of cattle running at large on the open ranges; but from various causes, chiefly overstocking and hard times, the large herds have been sold and the business has undergone a radical change.

Now there are more and smaller herds of well-improved cattle, generally kept in pastures, and the most successful cattlemen provide alfalfa and other hay to feed their stock whenever necessary on account of short grass or storms.

On some of our best farms are herds of thoroughbred Herefords as fine as can be found in the United States.

The high prices of cattle for the last year have been very encouraging, and the profits are much greater than under the open-range system.

This is also a fine sheep country, and there are numerous large flocks, chiefly in the eastern part of the county. The percentage increase is very large. The wool is of the best, and the expense of raising and caring for the sheep comparatively small.

Hogs are raised here at very little cost. They thrive well in alfalfa fields in summer and in winter they live on the alfalfa hay and artichokes, which produce large crops and are left in the ground to be eaten by the hogs as required.

There are now about 30,000 head of cattle on the ranges of Colfax County, and about 1,000,000 head of sheep, and the farmers and stock raisers of this county, together with the mine owners, constitute some of the wealthiest men in the Western country.

DAIRY FARMING.

Dairy farming pays well, and there is a good home market for milk, butter, and cheese, as well as for poultry, eggs, honey, and other products of the farm.

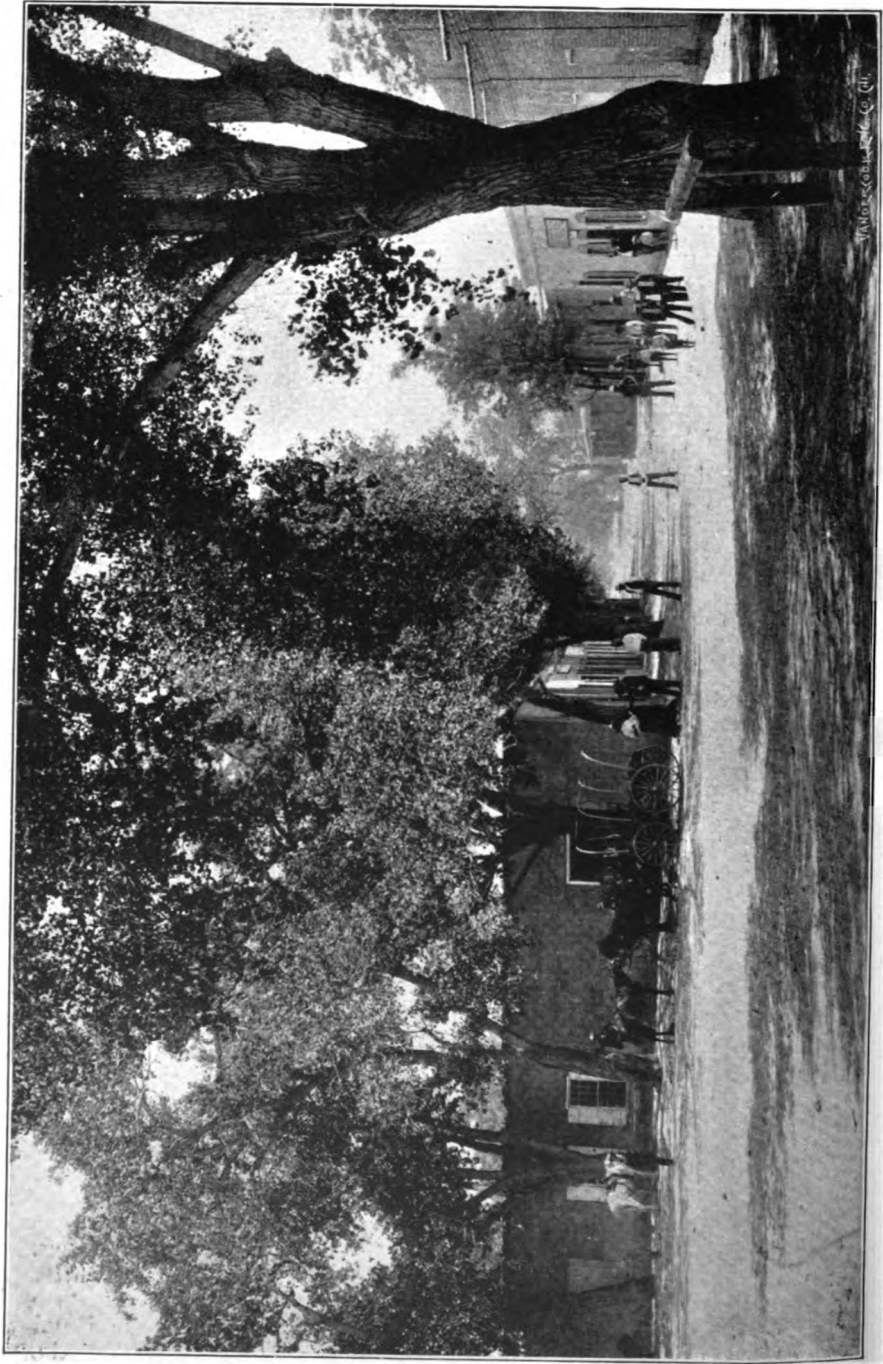
HORSES.

When the advantages of this altitude and climate for breeding and growing race horses become better known the fast horses of this country will be raised and trained here.

Our horses have better lungs, smaller, stronger, and more elastic bones and tendons, and greater endurance than those of any other part of the United States, and they have the speed, mettle, and stinging qualities of the Arabian horses from which the fast race horses of the present day are descended.

TIMBER.

There is a large area of timber in the county which is being worked up into lumber, bridge timbers, props, railroad ties, and telegraph poles. A number of sawmills constantly in operation furnish a good supply of timber for building for all purposes at reasonable prices.



STREET SCENE IN THE TOWN OF MESILLA.

Great changes have taken place here in the last quarter of a century. When the Santa Fe trail was first opened through New Mexico Colfax County was the home and hunting grounds of the Ute and Apache Indians.

The plains Indians, the dreaded Comanches, up to the year 1874, made frequent warlike incursions into the county, killing settlers and driving off their stock. Under the leadership of such intrepid men as Kit Carson and Lucien B. Maxwell, who lived at Cimarron, Colfax County, R. L. Wooten, and others, the settlers, aided by the Utes and Apaches, who were generally friendly, and the United States troops, finally subdued the Comanches. The other Indians were removed to Government reservations about eighteen years ago. Then followed the usual experience of a frontier country, with "road agents," "rustlers," and desperadoes. Then came the days of the cattle kings and the festive cowboy, with his lariat, big spurs, and ever-present six-shooter.

The reign of the "cattle kings" was short. They made way for the small ranchmen and farmers. The grama grass grows now over the old Santa Fe trail; the days of the six-shooter are gone, never to return; and soon only pictures and legends will be left of the wild and woolly cowboy. The wooden plow of the native has been replaced by the modern sulky plow, the reaping sickles by the self-binder, and on our best farms can be found all the latest improvements of husbandry.

Life and property are as safe here as any place in the world, and persons seeking healthy happy homes, where the investment of moderate capital will yield handsome returns, will search the world in vain for a better place to locate.

When the people in the crowded regions to the east of us learn the beauties of our country and climate; when they ascertain that the things which make life a burden to many of them—the sultry heat of summer, the extreme cold of winter, cyclones and blizzards, floods and droughts; consumption, malaria, asthma, hay fever, and a host of kindred diseases—are things unknown in this favored land, many of them will come to New Mexico as a place of rest from the storms of life.

The people of Colfax County, the gateway to New Mexico, will always bid them welcome.

DONA ANA COUNTY.

ITS RESOURCES AND FUTURE PROSPECTS.

Dona Ana County is situated on the Mexican boundary line, between Grant County on the west and Eddy County and the southwest corner of Texas on the east and south. On the north it is bounded by Lincoln, Sierra, and Socorro counties. It contains 8,200 square miles and includes a country almost unrivaled in variety of soil and climate. It is provided with about 200 miles of railroad, in the shape of a triangle, formed by the Santa Fe route and the Southern Pacific Railway. They start from El Paso, a few miles from our boundary line, the former running north to Rincon, then branching off southwesterly to Deming and Silver City, and the main line running north via Colorado to all points in the United States, the Southern Pacific running through the southern and eastern part of the county on its way to the Pacific coast. Seven large trunk lines are tributary to this county, giving us an outlet to all parts of the world. A new railroad is being built from El Paso through the eastern end of this county, which will tap large coal and mineral deposits, gypsum beds, and one of the largest forests in the world. This road will also soon connect with either the Rock Island or Santa Fe, and will have through connection with the Eastern States.

Dona Ana County lies almost wholly in the basin of the Rio Grande River, which flows through it in a southwesterly direction, carrying water enough, if properly utilized, to make a world-renowned grana and vineyard. An English syndicate is making arrangements to build a large storage reservoir, canals, etc., which will cost about \$2,000,000 and when completed will hold sufficient water to irrigate several millions of acres of land.

Irrigated land will yield double, and sometimes three times, the amount produced on Eastern farms, and a sure crop is guaranteed.

Stretching around it, and beginning at the Florida range of mountains as its mid-western boundary, Good Site, Santa Magdalena, Sierra Caballos, the Sacramentos, Jarillas, Huerco, and Franklin ranges of mountains, while the Sierra, Oscuro, San Andres, Black Mountain, and Organ Mountains pass through its center in a grand and beautiful series of peaks. The White Mountain, in the northeastern part of the county, is over 13,000 feet high and is perpetually covered with snow. The southwestern corner of the county is included in the sink of the Mimbres. Here springs abound and water is everywhere obtained at a slight depth. The mineral richness of this portion of the county is great, as it is also in the Organs, Black Mountain, and Jarilla ranges of gold, silver, lead, copper, coal, and turquoise being the predominant ores.

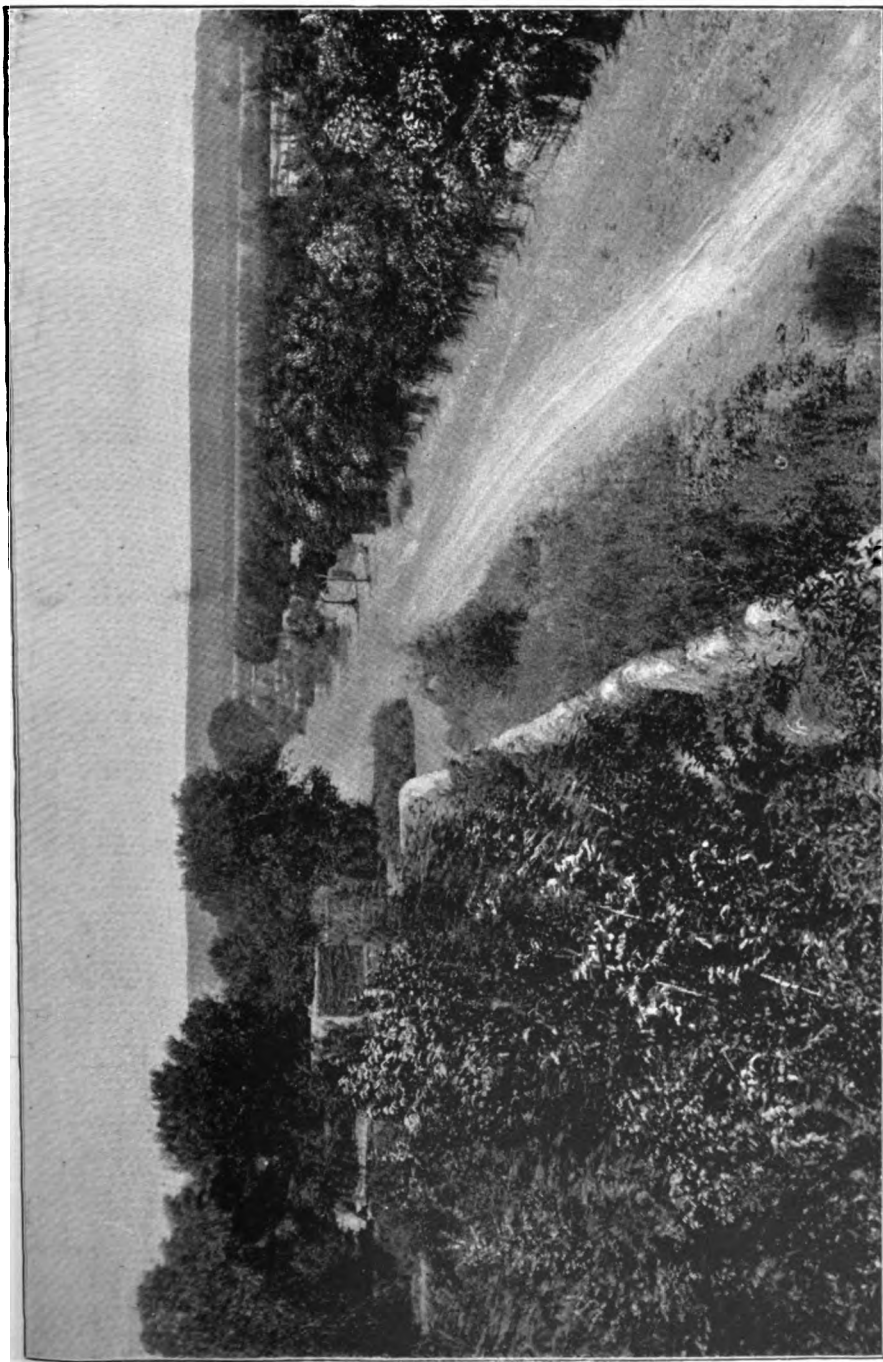
The Mesilla Valley is bounded on the east by the Organ Mountains, on the west stretches a high table land which breaks down from the Magdalena Mountains. Large cattle ranges dot here and there the large mesa.

Las Cruces is the commercial center of this rich valley, and is the county seat. It has a population of 3,500. Here are located the Territorial and Government agricultural college and experiment station, with over 200 students, the Academy of the Visitation, a Catholic academy for young ladies, first class public schools, and two mission schools which furnish every educational advantage for the young. It has three weekly newspapers; its streets are systematically arranged and named, each corner being labeled with the names of the two passing streets. Las Cruces has three churches, Catholic, Presbyterian, and Methodist. Here are located twelve large stores, several of them containing an immense stock of varied merchandise, the stores and buildings occupying acres of ground, three drug stores, three barber shops, two large modern flouring mills, and a canning factory. One comes here and sees the wide alfalfa fields growing, luscious orchards, grain fields, and vineyards, and is impressed with the beauty of the scene. All kinds of semitropical fruits grow here in abundance. Our surplus products are shipped all over New Mexico, Colorado, Kansas, Nebraska, Missouri, and as far east as Chicago.

The Mesilla Valley proper is about 50 miles in length, and averages about 10 miles in width, containing about 500 square miles, aggregating 32,000 acres of irrigable lands, surrounded on all sides by foot hills and the adjacent mountain ranges.

This section compares very favorably with other portions of New Mexico. The Territory is of a generally mountainous character, very rich in mines, timber, and live stock, while the Mesilla Valley is devoted to agricultural interests, horticulture, and live stock exclusively.

The Territory of New Mexico is over 400 miles in length north and south, and the altitude of the northern portion is from 6,000 to 9,000 feet, while the Mesilla Valley is but 3,500. The Territory presents a great variety of climate, the Mesilla Valley being semitropical, with



ROAD BETWEEN THE TOWNS OF LAS CRUCES AND MESILLA.

little frost and snow. The thermometer very rarely goes to 5 above zero. In July, August, and September the temperature is from 75 to 95 degrees, sometimes going up to 100 degrees. There is always a pleasant breeze, and the nights are simply delightful. A temperature in the east is far more prostrating and dangerous than the highest temperature experienced in the Mesilla Valley; the absence of humidity in the atmosphere is the cause of this.

The average rainfall is 6 to 10 inches. It usually rains a day or two at a time with intervals of weeks of cloudless weather. Violent storms are practically unknown. We have some little wind during the months of February and March, but such windstorms seldom average over 12 miles an hour.

This valley is a natural sanitarium for lung and throat diseases, the climate being very favorable for such affections. Most sufferers of this character coming here are greatly benefited, and if they do not put off coming too long permanent cures are effected. The climate needed for pulmonary troubles is a mild dry climate. The Mesilla Valley has just the climate to cure consumption and kindred diseases, and eminent specialists now recommend our valley for this purpose.

Malarial or epidemic diseases prevail less than in any other part of the United States. The dryness of the atmosphere is unfavorable to the transmission of disease germs.

The soil is composed of the accumulated washings from the surrounding hills, made up of the fine particles that have been, during countless ages, disintegrated by frosts or the chemical action of the atmosphere. The water from the Rio Grande charges the land after every irrigation with new fertility. The sediment left on the land after every irrigation is almost equal to any fertilizer extant, the vivifying liquids bearing strong fertilizing elements, similar to the waters of the Nile in Egypt. This is no theoretic idea, thousands of acres of growing crops under irrigation rival in luxuriance those found in the world-famed valley of the beautiful Nile.

Analysis of the soil, taken from the November bulletin of the New Mexico Agricultural Station, located in this valley, shows the following: "About 8,139 pounds of sediment will be added to each acre in one year by using 2 feet of water. This would make a uniform layer about a quarter of an inch thick, and would contain 1,821 pounds of potassium sulphate, 116 pounds of phosphoric acid, and 107 pounds of nitrogen. In addition to this, about 90 pounds of potash would be supplied by the water itself. The soil is durable and as nearly inexhaustible as any known soil. The Indians and Mexicans have raised wheat and corn upon these lands continually since the advent of the early mission of the seventeenth century."

The water for irrigation is applied in the following manner: For grain and alfalfa the water is applied by flooding the entire surface of the land between the borders, usually 50 feet apart. For fruit it is run in furrows near the trees or vines.

Owing to the fact that the lands of the valley are nearly level, having only a slight fall to the west or east, sufficiently to carry water, there is little cost for leveling and preparing the land for irrigation, as \$1 or \$2 per acre will generally cover the whole expense connected with such preparation. Deep, thorough, and frequent tillage is the only treatment of the land required, no fertilizer being necessary. The water costs from 40 to 75 cents per acre. Perpetual water rights are attached to the land, entitling the owner to all the water required for irrigation as long as water remains in the river. The water for irri-

gation of this land is obtained from the Rio Grande by means of irrigating canals. Experience necessary in raising fruits and crops can be easily and rapidly acquired. The leading and most profitable varieties of fruits are peaches, apricots, apples, pears, grapes, and quinces, and all kinds of berries.

The Territorial market consumes the greater part of the fresh fruits. The surplus is shipped in refrigerator cars, or dried and canned for the Eastern markets.

Fruits are not the only product of the soil; there is a large acreage of alfalfa, wheat, and other grains.

EDDY COUNTY.

PRINCIPAL POINTS OF THE YEAR'S HISTORY.

Eddy County has continued to forge ahead in material progress and prosperity the past year. The advantages and institutions possessed by this section, and which were outlined in my last annual report, have been increased and added to, while new features, then only in contemplation, have been developed and opened up.

Each succeeding year but proves the merit and value of irrigation farming in the Pecos Valley. As the farmer more thoroughly comprehends its possibilities and results, he appreciates how superior it is to the old methods. From despairing hope that the needed rains will come, a change is made to the certainty of moisture, and plenty of it, at the right time.

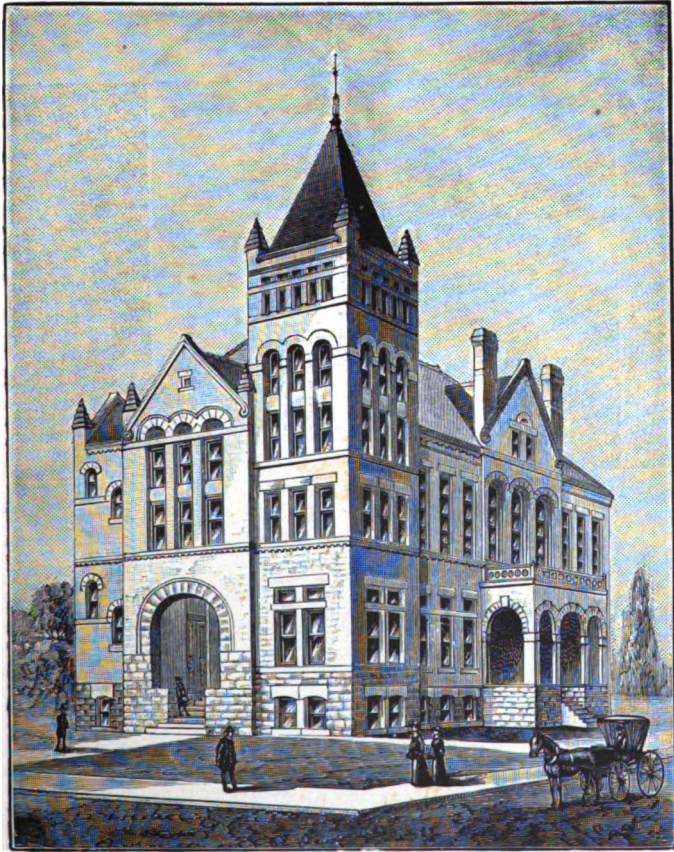
The Pecos Valley admittedly offers the best advantages for irrigation farming in the entire West. Thus fortunately and richly favored, the effort is being made to colonize this portion of New Mexico with a thrifty, enterprising, and frugal class of farmers—those who appreciate the privilege and desire to avail themselves of the opportunity to provide themselves with a home.

The farm is a home; not a place to be lived at to-day and moved from to-morrow, but a home to be improved and beautified, a home where orchards are to be planted, where vines are to be grown, where substantial things are to be constructed, where children are to be born and fathers are to die. Into the fields come and reap new generations; out of the fields and into the graveyards pass old generations; and this is the class of farmers who are wanted, and are coming in, to till the soil and establish homes in the Pecos Valley.

There are people in the East who have their eyes turned westward— young men, middle-aged men, all classes, who are constantly looking for opportunities in the West, and who go to make up that ceaseless tide of humanity that flows to the sunset side of the continent. There are thousands of young men and others further on in years in the Eastern and Atlantic seaboard States who have seriously in mind the question of accepting Horace Greeley's advice, "Go West, young man; go West." They have fostered the idea since childhood, when all that detained them was the representation that the West was a boundless waste, populated by savages, cut-throats, and lawless men.

Now the advice given in the great cities of the East is not to go West, for there is no West; that it is built up; that all the golden opportunities have been snapped up long ago; that the paths leading to fortunes are crowded, and that those who join in now are sure to be hindmost, and, consequently, subjects for his Satanic Majesty.

All this is in a measure true of many of the Western States, but not of southeast New Mexico, the portion incorporated within the Pecos



EDDY COUNTY COURT-HOUSE.



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HISTORY OF
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NEW-YORK
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Valley. The Pecos Valley is a section which it is confidently believed leads all others, not only for the pursuit of man's primeval occupation, the tilling of the soil, but as a dwelling place, the home of the health seeker and invalid and those in pursuit of happiness.

NEW LINE OF RAILWAY.

As a means to this end, and as a valuable adjunct to the increased and greater prosperity of the valley, the present construction of the Pecos Valley and Northeastern Railway is probably the most important event in the year's history of this section. As outlined in my last report, the operated line of railway in the Pecos Valley was from Pecos, Tex., to Roswell, N. Mex., a distance of 164 miles. This road is now being extended to Amarillo, Tex., a distance of 208 miles, making the whole road 372 miles in length. The contract for construction stipulates that the road be completed and turned over to the operators by December 15, this year, and there is no reason to doubt that it will be strictly complied with.

The completion and operation of this line means much in every way to the Pecos Valley.

The country tributary to the line from Amarillo to Pecos is the largest and best cattle-breeding territory in the whole Southwest. South of Pecos City to the Rio Grande, a distance of over 200 miles, the country is filled with cattle, which are now shipped over other roads via Fort Worth or driven across the plains and shipped from Amarillo and Panhandle, Tex. Considering these places as one, they constitute the largest initial cattle-shipping point in the United States. They average now fully 180,000 head annually. Some of them go north over the Fort Worth and Denver road to Wyoming and Colorado, for summer feeding. Cattle from southern Arizona and from New Mexico arriving at El Paso are at present taken by train east to Fort Worth (615 miles), thence northwest to Amarillo (320 miles), and delivered to the Santa Fe for the feeding grounds in southern Kansas, the route making two sides of a triangle. Many thousands of stock cattle ("feeders") are also shipped from this territory over the Atchison to points in Kansas, or delivered by it to the Chicago, Burlington and Quincy road for transportation to the pastures in Wyoming.

With the new transportation facilities, the business of fattening cattle for the Kansas City and Chicago markets on the cheap food raised on the irrigated lands in the Pecos Valley or on the refuse from the sugar factories will assume large proportions. One hundred thousand tons of sugar beets will make 40,000 tons of beet pulp, which is excellent for fattening and dairy purposes. It is estimated by those who are thoroughly familiar with the business, including F. P. Morgan, who has been live stock agent for the Atchison in charge of the cattle traffic in this section of the country for the last eight years, consequently well qualified to judge of its extent, that this line will carry, from all points on it to its connection at Amarillo, at least 18,000 car loads annually.

The fact that all cattle hauled through Fort Worth for Northern markets or for feeding grounds during the months in which the great bulk of them are shipped have to go within the United States quarantine or infected district, necessitating their being subject to stringent regulations, occasional delays, and to be viewed with suspicion, while if shipped over the Pecos Valley and Northeastern Railroad they would be entirely clear of quarantine regulations, is a sure guarantee that the greater part of all the cattle south of the Texas and Pacific and all

coming from the south and west of El Paso for the Kansas, Wyoming and Montana feeding grounds would be hauled over the Pecos Valley route.

The greater part of the country between Amarillo and the Pecos River northeast of Roswell is a large, level plateau covered with grass, ample water of first-class quality being easily obtained by means of drive wells, the water being raised to the surface by windmills. The rainfall in the greater part of it is sufficient for sorghum cane, millet, Kaffir corn, and other good cattle feed. The land is largely owned in moderate-sized tracts by those who live on them and raise cattle for market. From the force of competition, the necessity for more room, and the fact that sheep can be raised cheaper and are healthier in the more open country of the southwest, the sheep and wool industry is gradually moving in that direction from the central portions of the United States. The Rio Grande on the south and the mountains to the west of the valley make a natural division in this part of the country, and flocks are increasing very fast. The mild winters and good feed increase the percentage of lambs and fit them for early market. With the building of the new line this traffic will be greatly stimulated. Several good supply and cattle-shipping points for the immense country north and south of it will be established on the new line.

Thus briefly can be seen what effect the new road will have upon the Pecos Valley districts of New Mexico.

STOCK-FEEDING INDUSTRY.

An industry with which Eddy and the Pecos Valley has identified itself the past year, and which gives promise of expanding to mammoth proportions within the immediate years, is the fattening of sheep and cattle on alfalfa for the eastern markets. It is not only a profitable industry by itself, but in conjunction with Pecos Valley agriculture, it will prove a most gratifying source of financial returns to the farmer. Since the fall of 1896 the sheep industry in the valley and the adjacent territory has more than trebled in value, and in the amount of income realized from it. The encouraging conditions have caused the investment of a large amount of capital in sheep, and the returns realized have placed the business in the list of the most desirable for remunerative investment. A large number of fine rams have been purchased by flock owners for the purpose of improving either the mutton-producing or wool-bearing qualities of their flocks. The important feature has been firmly established in the past two years that one of the most profitable and satisfactory methods of utilizing alfalfa pastures is the raising of mutton lambs. Every practical experiment made in that direction has brought success, and there is every indication that the business will prove particularly attractive to persons of means whose condition of health compels them to seek an outdoor life, but requires also that they must be surrounded with the comforts of home and avoid exposure. In sheep, as in cattle, a good manager can not help but succeed. Fattening lambs for shipment has in the past been slightly handicapped for the lack of direct rail connection with the Eastern markets. Last year about 18,000 or 20,000 head of sheep and lambs were driven out and fattened in Colorado or Kansas. It was impossible to feed them in the valley because they could not be shipped out when fattened on account of the long railroad haul.

With the advent of the new road—the Pecos Valley and Northeastern, now building—things will be in a different condition. Instead

of having to drive lambs across the country to some point on the Santa Fe, they will feed them right here. It will be only a few years when Pecos Valley lambs will be as well known on the Chicago and Kansas City markets as Colorado lambs are now. Alfalfa, corn, and lambs make a good combination. It is an industry full of promise. It brings money to the owner of large flocks who ranges his sheep. It affords the farmer a home market for beets and grains, makes a demand for his pasture, and affords him an opportunity of having a flock of his own on his farm, thus providing a crop of lambs for spring sales, the returns from which will be a neat sum to place on the profit side of his farming operations. Owners who allowed their sheep to go because wool did not pay have discovered that they made a mistake. A sheep is worth more now than the sheep and wool combined a few years ago, owing to the increased demand for better mutton. Farmers who have tried cattle, sheep, and hogs give sheep the credit of bringing the highest profit in proportion to capital invested, and in another decade the sheep of this country will be more valuable, because they will average larger size and be of better quality for market.

There is not the slightest doubt as to the merits of sugar beets as a fattening feed. The Pecos Valley can and does raise them in abundance. Alfalfa is a forage unexcelled. It likewise flourishes in no other section with greater luxuriance than in the Pecos Valley. What corn is needed can be produced here, or, if desired, when the new line of railway reaching to the East is completed, the cheap Kansas article can be brought in at a slight expense. A judicious feeding of the combination, and train loads of "early spring sugar lambs" should go out from the Pecos Valley to scoop the Eastern markets.

This is not a fanciful picture. It is a very present fact, being practiced yearly in Colorado and Northwestern States, with much profit to those engaged therein. An abundance of feed, a mild winter climate, freedom from disease, and other natural characteristics, which can almost be said to be peculiar to this particular section, make the plan as outlined a particularly inviting one. It promises rich financial gain to those who identify themselves with it and who carefully and intelligently encourage and foster it.

Owners of cattle are following along similar lines. Their stock is being improved, and the tendency is toward pure blood and high-grade animals. Winter feeding is being quite generally practiced, and it will only be a short time till Eastern markets will be supplied with a most desirable article of alfalfa-fed beef.

CELERY PRODUCTION.

A product in which the Pecos Valley is gaining special distinction is its celery. It is an industry which is developing rapidly, and constantly acquiring new markets. The most extensive production of this delicacy is near Roswell, on the Spring Brook Celery Farm. The farm is watered by a great spring of water bubbling from mother earth, which, combined with the continual sunshine peculiar to the Pecos Valley and the saline nature of the soil, makes a combination for growing a high grade of celery not possessed by any other country. The constant sunshine, which blushes the apple, crimsones the cherry, ripens the golden grain, colors the flowers, and flavors the fruits with the choicest essence of nature's brewing, is no less potent in storing up those essential qualities in celery that raise it to a standard excellence, surpassed by none, equaled by few, and may be well said to bear the same relation to the

celery trade as gold to the monetary system. The celery raised in the Pecos Valley is pronounced, by those qualified to judge, superior to that raised anywhere else in the United States, and the fact that it leads all competitors in every market it has reached would seem to verify the assertion, particularly when it is known that it came in competition with the product of the most famous celery farms in the whole country. The soil of the valley seems to possess to a marked degree the constituents which impart to this table delicacy the peculiar nutty flavor so much sought after by epicures. The Spring Brook Farm has proven a full success, both in the production of the vegetable and in marketing it to financial advantage. The Roswell Register notes this fact in a recent paragraph, which says: "W. M. Farmer has just received returns from his last shipment of celery. The total figures show that, in addition to supplying the local demand, he shipped out 88,815 pounds. The express bill on this was \$1,389.80. The gross income realized at the farm for the crop of twenty acres was over \$6,000.

The planting on this farm has been increased to 25 acres this season, while all over the valley farmers are putting in beds of greater or less extent.

NEW MEXICO'S BEET SUGAR FACTORY.

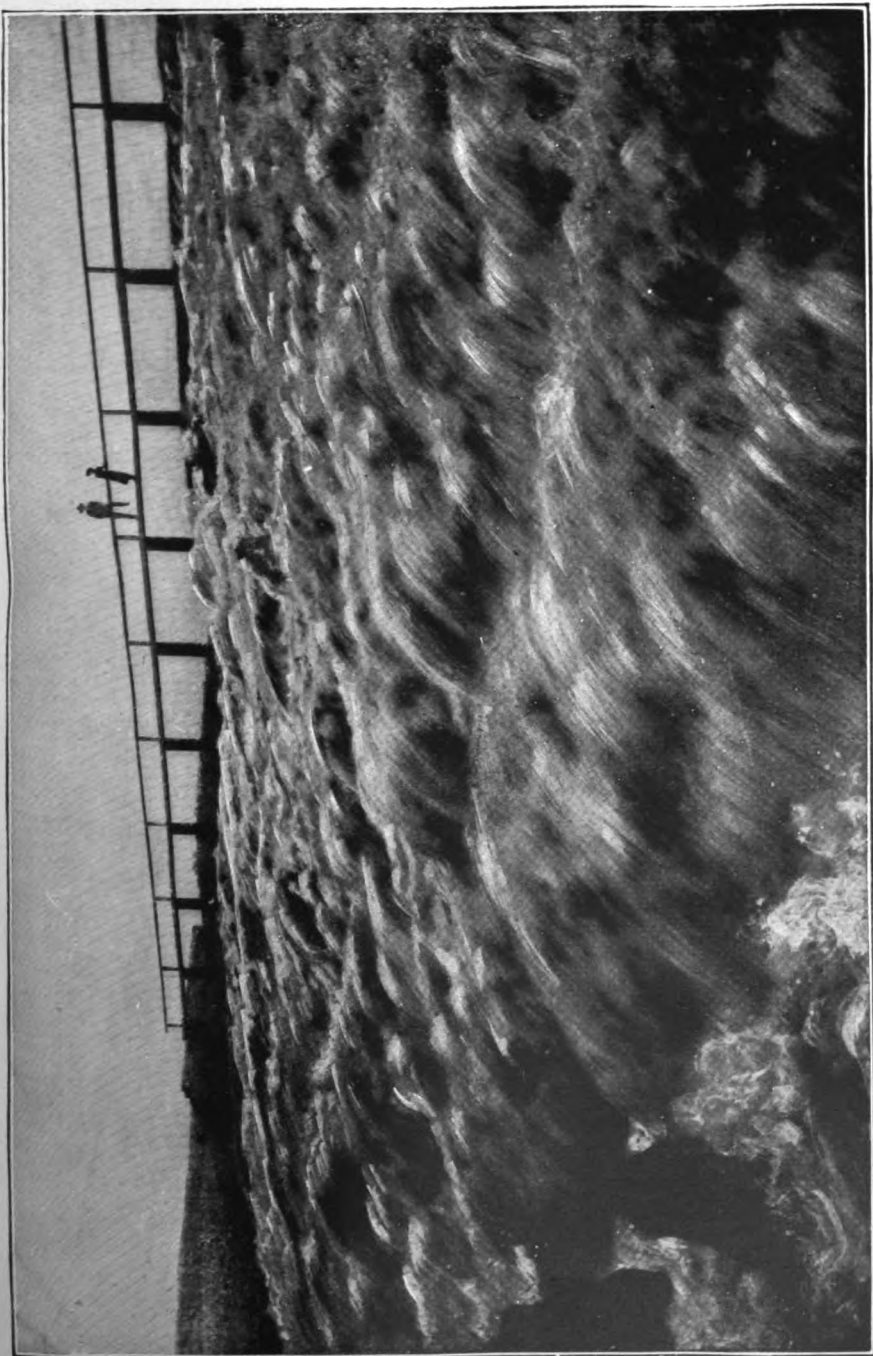
The second campaign of the Pecos Valley Beet Sugar Factory, which had just been inaugurated at the time of transmittal of my last annual report, proved very satisfactory and successful. The supply of beets, while slightly curtailed, was sufficient to permit a campaign of reasonable length, and the result was very gratifying. This season the acreage planted in beets has been largely increased, and the number of tons which will be delivered to the factory which commences its third campaign during October will far exceed that of any previous year. The farmers have learned by experience the manner of cultivation of the crop which insures success, and each succeeding year finds them more enthusiastic than ever over its certainty and gratifying financial returns. The management of the factory is engaged in making extensive improvements in the machinery, that the beet crop may be more expeditiously and profitably handled. It can be said that the present factory has revolutionized farming methods in the Pecos Valley, and is and will prove the medium making small and diversified farming profitable. Experience in other beet-growing districts proves that the best results are attained where only 10 or 15 acres are allotted a grower. More careful attention results, and better returns from the crop follow. This is the plan which the company is striving to inaugurate here, and while necessarily its adoption is slow, it will ultimately be accomplished. Recent bulletins issued from the United States Department of Agriculture show that from all the tests made of beets from every portion of the United States, those grown on the irrigated lands of the West proved to be the richest. Pecos Valley beets, both in sugar content and purity, were at the top rank.

With a combination of the beet-sugar and stock interests, the Pecos Valley is guaranteed a magnificent future from these alone, but added to the many other equally as important and profitable interests, the success crowning the coming years is placed beyond the pale of peradventure.

EDDY HAS A CREAMERY.

AN OPPORTUNITY FOR VALLEY FARMERS.

In detailing the improvements, the advantages, and the industries with which Eddy is supplied, The Argus has entirely overlooked a young industry which promises much for the future and already offers an exceedingly favorable opening for profit



SPILLWAY, EDDY IRRIGATION RESERVOIR.

to valley farmers. Reference is made to the creamery of the Hillside Dairy Farm, owned and operated by F. E. Bryant.

Already the establishment is equipped and arranged in a manner which would reflect credit upon a community much larger than the one in which it is located, but there is no disposition to stop now; further expansion is contemplated, and with the co-operation of the farmers of the valley, will soon be a reality.

The Hillside Dairy Farm is well known to the people of Eddy, being the medium through which they are supplied with milk. The stock of the farm is pure bred, being mostly of Jersey grades, with some Durhams and Holsteins. They number about 70 head, cows and calves. Thirty-one of these furnish the daily supply of milk for the town and the creamery separator.

The creamery was put in primarily to utilize the surplus milk, which it is now doing, but it could handle milk from all the farms in the lower valley. It has been in operation a little over a month, and is meeting with the best of success.

The plant is housed in a neat adobe building, built especially for the purpose. Has cement floor, and provided with necessary conveniences. The separator, the principal piece of machinery, of course, has a capacity of 750 pounds of milk an hour, at a speed of 5,600 revolutions a minute. At the present time, as has been said, it is utilizing only the surplus milk, that remaining after customers have been supplied, which is about 400 pounds daily, resulting in about 14 pounds of butter in the same length of time. Mr. Bryant states that he could easily handle 2,000 pounds additional, and this quantity the farmers of the lower valley, if they are wise, will take steps to supply. A little organization, a little enterprise and work, the securing of favorable rates for the transportation of the milk on the railroad, and another item of profit will have been added to farm life in the Pecos Valley.

The present completeness of the creamery has not been effected without expense. The equipment represents the investment of considerable capital. The separator is operated by a 6-horsepower engine. The creamery proper is provided with a cooler to which the milk goes from the separator, passing from there to the cream bath, which has a capacity of 50 gallons, where the cream is kept at a certain and desired temperature to properly ripen, till time of churning. An 80-gallon churn is provided for the latter service, and is operated twice a week. In addition to this there is a butter worker for extracting the buttermilk from the butter, a milk tester for ascertaining the per cent of butter fat which the milk contains, and several other appliances.

But few people have a knowledge that Eddy is possessed of a dairy and creamery so complete in every detail. It is the nucleus of what in a very short time will prove a profitable and mutually beneficial industry.

WEALTH IN SULPHUR.

BEDS CLOSE TO A PECOS VALLEY STATION.

The following article on the sulphur beds lying just west of Guadalupe, on the Pecos Valley road, is taken from the El Paso Herald. A number of Eddy parties are interested in the deposits, having been engaged for some time in investigating them. During the past two months E. Miall Skeats, of this city, has spent considerable time there, and The Argus believes that he is very sanguine of the results. The article from the Herald is as follows:

"One of the greatest sources of the as yet undeveloped mineral wealth of El Paso County lies in the extreme northeastern portion of the county, and is in the form of almost limitless deposits of nearly pure sulphur, easily accessible and requiring but little capital (chiefly for refining works) to place it on the market as a finished product. These deposits fill numerous patelliform basins or craters of extinct volcanoes on the plains southeast of the southern point of the Guadalupe Mountains, beginning 2 to 3 miles south of Delaware Creek and 12 miles west of Guadalupe station, on the Pecos Valley Railroad. So far they are known to exist on some twelve or fourteen sections of land, and are believed to extend over many more, though but twelve claims have been located and these but superficially prospected by shafts usually from 12 to 15 feet in depth, only one being as deep as 30 feet, and all these in nearly pure sulphur to the greatest depth attained. The region round about might be called a prairie, though dotted here and there with low hills overgrown with scrub cedar and covered with the finest grasses. Numerous springs of pure water exist in the vicinity, and Tinnin's great spring ranch lies 6 miles south.

"These basins or craters are usually from 600 to 700 feet in diameter, and toward the center it declines to a depth of 3 or 4 feet, the surface being a thin covering of blackened earth, strongly impregnated with sulphur, and presenting the appearance of having been blackened with sulphuric acid. In one shaft, sunk in the hope of

striking water, a liquid was encountered at a depth of 15 feet, but on being tasted it proved to be very strong sulphuric acid, and when the taster hurriedly ejected it from his mouth, adulterated with saliva as it was, it stained deeply and did some injury to his coat sleeve. It is believed, however, that this acid is small in quantity, detained by some solid rock basin, and that it was formed by percolating rain water taking sulphur in solution as it descended.

"As indicating the process by which these vast masses of sulphur were deposited, time has left no trace. As the country round about is gypsum, it might be inferred that both minerals were deposited from sulphur springs, or springs containing sulphide of hydrogen, which sometimes deposits sulphur by the partial oxidation of the hydrogen, and gypsum by the more complete oxidation of the hydrogen. Such springs flowing into a basin lake then covering the region would pour limitless quantities of sulphide of hydrogen (only partially oxidized) down the craters of extinct volcanoes, thus ultimately filling them with sulphur to unknown and probably very great depths, while the impregnated water spread out in the shallow lakes would become more completely oxidized and deposit the gypsum beds now found surrounding the craters. Or, as the craters of extinct volcanoes (as in the case of Popocatepetl) are frequently found plugged with sulphur, it may be that this mineral, in a sublimated state, arose from great depth and was precipitated on the lips and walls of the crater until the orifice was filled. But, whatever the process of deposition may have been, it is certain that these deposits of sulphur are of such vast extent and purity that El Paso is destined to rival the famous sulphur deposits of Sicily, from which island the United States alone formerly imported \$50,000,000 worth of sulphur annually.

"Near the surface of the basins in question, where more or less earthy matter has become mixed with the mineral, and even pebbles of foreign rock are embedded, the mass shows only about 60 per cent sulphur, but deeper down the sulphur is found almost pure (98 per cent) and in massive beds, finely lined with varying colors and resembling the finest yellow clay. Twelve different companies have already treated and partially prospected claims, and one of these companies has projected a railroad from Guadalupe Station, on the Pecos Valley Railroad, to the mines, there being already a fine wagon road to the south, extending 30 miles west from the Pecos Valley road. As these deposits are numerous, doubtless of great extent or depth, and are known to be exceedingly rich, the field is an inviting one for prospectors and small capitalists. The material can be mined and refined at little cost, and can be marketed at wholesale at \$32 per ton for roll and \$33 to \$35 per ton for flour."

CLIMATIC—THE HEALTHFULNESS OF PECOS VALLEY CLIMATE.

The Pecos Valley is above all else a healthful section. It has long been known that the climate of the elevated region at the eastern base of the Rocky Mountains possesses wonderful curative properties in a wide range of chronic diseases, and particularly those of the throat and lungs. During the past twenty five years thousands of people, most of them consumptives, have come to this region of pure, dry air and abundant sunshine; and a large majority of these have been cured or have found a measure of relief. It should, therefore, be a vast sanitarium, with an almost world-wide fame.

In no other part of this region are the general conditions more favorable from the standpoint of health than in the Pecos Valley. The altitude, which ranges from 3,000 to 3,800 feet, is that best suited to the majority of health seekers, being great enough to insure a dry and tonic atmosphere, and yet not so great as to develop any latent heart trouble. The rainfall is slight, and is confined principally to dashing summer showers. The sun usually shines from a cloudless sky. A delicate invalid can spend out of doors most of the hours of an average winter day. There is an exhilaration in the dry, light, tonic, and electrical atmosphere, and a charm in the continual sunshine that must be experienced to be understood.

It is also efficacious in the various forms of nervous prostration and dyspepsia; sufferers from rheumatism and neuralgia may also expect relief. In fact, most chronic troubles are cured or helped.

The best testimony as to the healing and life-giving qualities of the

atmosphere and the general environments of the Pecos Valley is from the pen of Dr. Charles M. Whicher, a practicing and most competent physician of Eddy. He says:

For some years the appreciation by the medical profession of the value of the south-eastern New Mexico climate as a panacea for many diseases of a constitutional character, and a sure relief for others, has been rapidly on the increase. The physician's faith and belief in this is well founded, for without doubt, had we some accurate record of the cases of invalidism that have come to this part of New Mexico, the Pecos Valley, these records would show a series of remarkable and astonishing reliefs, betterments, and cures of cases of disease previously considered hopeless. While the record in these cases can not be obtained to a certainty, yet there is one thing that can—the record of deaths. And it would seem almost improbable, did not facts back up the statement, that the number of deaths could be so few in such a comparatively thickly settled district.

In the whole county of Eddy, containing some 3,000 inhabitants, there have been but three deaths in the past six months, and all of these were infants. Of these, one death was caused by meningitis, one by cerebral abscess, and the third by congenital bowel trouble.

Is not this a health report of which any county might be proud? And where is any other county that can boast of such a record? Not one other, I venture to say. The almost perpetual sunshine, winter and summer, the pure, dry, and health-giving atmosphere, that knows no contamination from the passing in and out of cities and the habitation of man, comes direct to us from not distant mountains that reach far up into the blue heavens and gather for us the life-giving elements of pure air.

Primarily, this air of the Pecos Valley is for the sufferer from pulmonary troubles, and to such it is truly a godsend, for in the cure or relief of disease of this character the first requisite is dry air, the next pure air, and lastly, air of moderate temperature. The Pecos Valley has them all.

One visiting the Pecos Valley for the first time must evidence surprise when he sees, week after week and month after month go by without, practically, a day passing when the sun does not show itself—days which have been fittingly spoken of as but "samples of Paradise days." The advantage of these glorious days is enjoyed to the fullest extent by the invalid in walks and drives about the country, or in lying indolently in a hammock and reveling in the luxury of dry, pure air. It could be said with a great deal of truth that half the prominent residents and business men of the Pecos Valley are but walking advertisements of the health-giving qualities of this climate, for among them are many who came here for the express purpose of finding lost health and vigor, and to-day they are as well and energetic as ever, and happy in the enjoyment of sound health.

In my own practice—and I believe this applies as well to my fellow-practitioners—there has not been a single case of acute infectious disease in the valley during these six months. What few infectious diseases have been known in the Pecos Valley have been of a very mild type, never virulent.

The freedom from sudden and decided changes in temperature is one of the best points of recommendation in the Pecos Valley; all people, whether in poor or good health, are benefited by an even, moderate temperature. Of the dozens of cases of those afflicted with lung complaints who have come to the valley for relief, I know of but one or two instances in which the change was not of great benefit, and in many cases entire cures were effected. When an invalid waits too long, until almost the last minute, when death has a decidedly firm grip on him, the Pecos Valley is not to be blamed if he does not recover; but given a fair opportunity, the climate of this place will restore to health many cases which have elsewhere been considered hopeless.

The great point, then, with those contemplating a change of residence to this "natural sanitarium of the world," as the Pecos Valley has been well described, is to beware of procrastination. When Pecos Valley air does not aid those afflicted with pulmonary troubles, it will, as a rule, be found that "the thief of time" is in fault.

GRANT COUNTY.

In the extreme southwestern corner of the Territory, is cut in twain by the continental divide, and contains 9,524 square miles, or 6,095,360 acres—an empire within itself capable of supporting a population of 50,000 people. It is one of the most progressive sections of the Territory, and, unlike other portions of our country, it does not date its civilization from the days of Montezuma, though along several of the mountain streams of the county the caves at one time occupied by the

"cliff dwellers" may yet be seen, some of them at almost inaccessible heights above the stream below. Some signs of more recent date than those of the "cliff dwellers" are found in the ruins of whole villages, the regularity of the structures showing a considerable degree of architectural science.

Grant county dates its settlement from the disbanding of the "California column" at the close of the civil war, and yet it ranks high in point of wealth, and has a brighter prospect than any of its sister counties at the present time.

The real prosperity of the county may be properly dated from the advent of the Atchison, Topeka and Santa Fe and Southern Pacific railroads, which cross her borders and infuse new life into the county by bringing in capital and affording transportation for her world of mineral wealth and the thousands of bees which annually fatten upon her luxurious and nutritious grasses.

SILVER CITY,

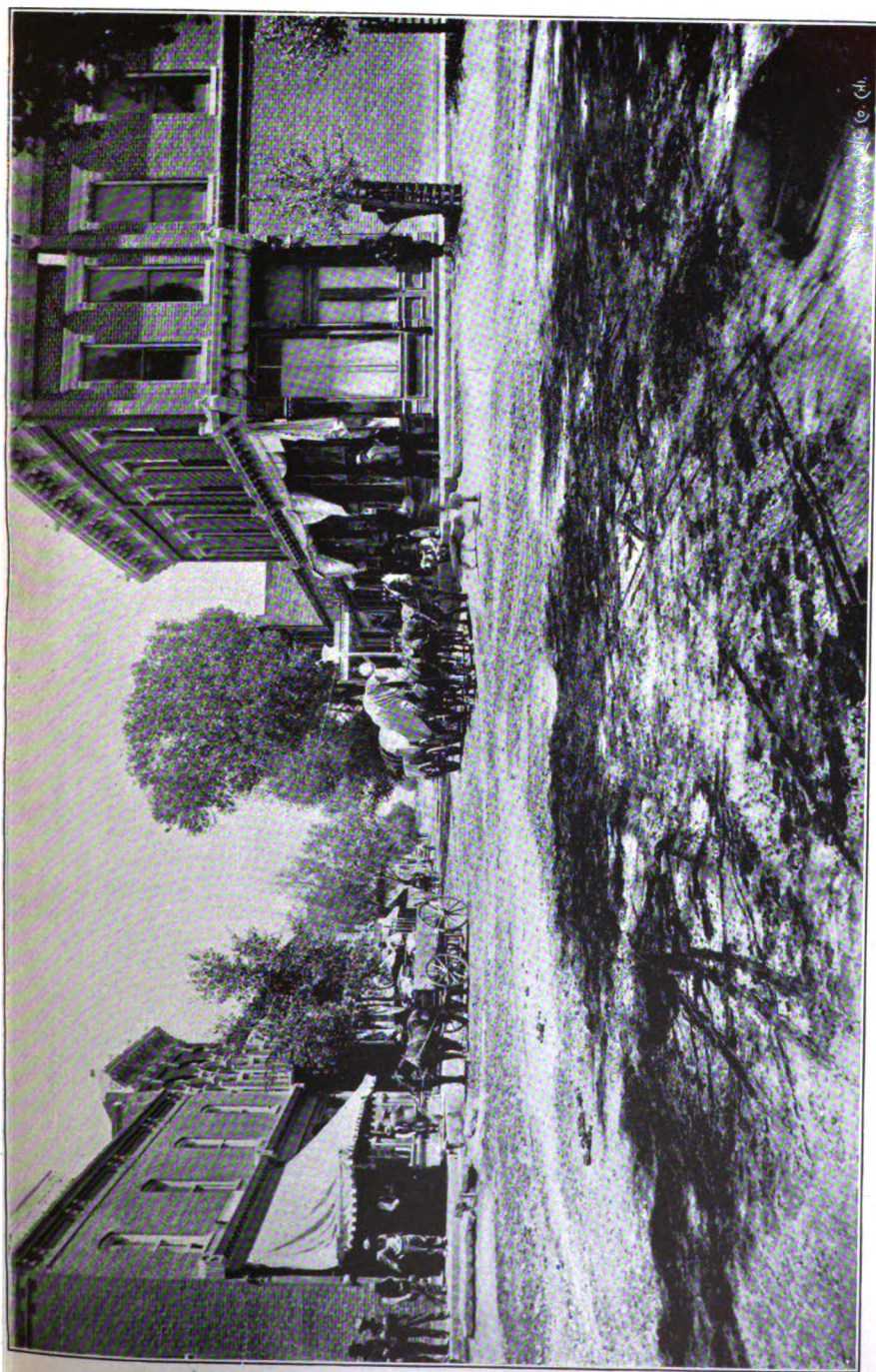
The county seat of Grant County, and by far the most important town of southern New Mexico, is the most thoroughly Americanized of any city in the Territory. It is delightfully nestled amid rolling hills, and by common consent it has been designated as an ideal spot in which to pass an existence; as nearly a paradise as can be found on this mundane sphere, where the health-giving atmosphere serves as a welcome balm to all, more especially to those troubled with pulmonary complaints. Grant County generally, and Silver City especially, has been highly recommended by physicians, and scores of people visit this section yearly to derive the benefit of its health-giving climate, and when they return home, it is done with reluctance.

Unlike most western border towns, the business edifices are constructed entirely of brick and stone, with handsome iron and glass fronts, and finished throughout in a most substantial and elegant manner. The commercial importance of the town justifies the merchants in carrying stocks of goods greatly in excess of those usually found in towns of the same size. The city is the main supply point for a vast country surrounding, comprising both grazing lands and mining camps, and nearly all of the big monetary transactions of the county are made through the medium of the Silver City National Bank. All branches of business are represented here, and the learned professions find as able exponents as can be found in any town of the West.

The residence portion of the city is a flattering testimonial to the energy and prosperity of Silver citizens, and they are the source of admiration to all observers. Brick alone is employed in building, and the architectural style in vogue is highly complimentary to the residents.

Although the city is usually spoken of as a mining camp, it has none of the wild and woolly element to contend with. The population in point of intelligence will compare favorably with any town of like size in the States, and law and order is the element that holds sway.

Silver City is justly proud of her school facilities, which are of a high order and attract many students from outlying neighborhoods. Besides our public schools, in which there are many departments, we have one of the two normal schools of the Territory in successful operation. The attendance is large, and the standing of the profession in the different classes is fully up to the average of any of the higher institutes of learning elsewhere. The Sisters of Mercy conduct the Academy



STREET SCENE, SILVER CITY.

of Our Lady of Lourdes, where Catholic children are trained up in the tenets of their religion, as well as receive the benefit of a liberal education.

The city is on a branch of the Atchison, Topeka and Santa Fe Railroad, has a daily mail and telegraphic connection with the outside world.

Of churches there are but two, the Methodist Episcopal and the Roman Catholic, both having a fair attendance and each exerting its influence for good.

In the estimation of some enthusiasts, Silver City is the original site of the Garden of Eden, as all that tends to make life pleasurable is here found in reckless abundance, and to die without having seen Silver City is to have lived in vain.

MINING.

Silver City Reduction Works.—One of the most important enterprises in the Territory is located 1 mile below the city on the Atchison, Topeka and Santa Fe Railroad, and it has proven a blessing to the small mine owner as well as a necessity to the entire country, as ores in any quantity are successfully treated and settlements immediately made. This feature has been a godsend to the poor prospector and miner of limited means, as he is thus enabled to continue development work on his claim. The works here were a financial success before they were purchased by the Hearst estate; since then they have been enlarged, additional machinery has been put in, and other necessary improvements made, until to-day they have no superior and few equals south of Denver, Colo. Ores from Santa Rita, Hanover, Pinos Altos, the Burro Mountains, and other sections of Grant County, as well as from Sierra and other counties in the Territory, as also some extensive shipments from Arizona, are being treated here to the satisfaction of all parties concerned. By fair dealing the management has made the name of the Silver City Reduction Works a synonym for probity and square dealing. If unlimited capital and perseverance coupled with knowledge and sound business methods are any criterion by which to judge, then the Silver City Reduction Works have justly earned a reputation, as well as aided materially in advertising the illimitable mining capabilities of one of the richest mineral sections on God's footstool.

Cooks.—The leading lead-producing section of New Mexico is by no means the least important among the mining industries of Grant County. Since the discovery of mineral here, twenty years ago, the camp has been the busiest in the Territory and has given employment to hundreds of workingmen. The ore is principally a sand carbonate, rich in lead, and even at the present prices for silver carries enough of the white metal to more than pay all costs of extraction, shipping, etc., leaving the lead as clear profit. During the year 1897 the mines here produced 10,800,000 pounds of lead carrying 81,500 ounces in silver, all of which found its way to El Paso, Tex., and the major portion of which was treated at the International Smelter. The attention of the mining world has frequently been attracted to Cooks during the past few years by reason of the immense deposits of high-grade lead ores discovered, as well as the sudden rise to wealth of comparatively poor men, whom none envy, as they are justly entitled to all the good fortune which has attended their efforts.

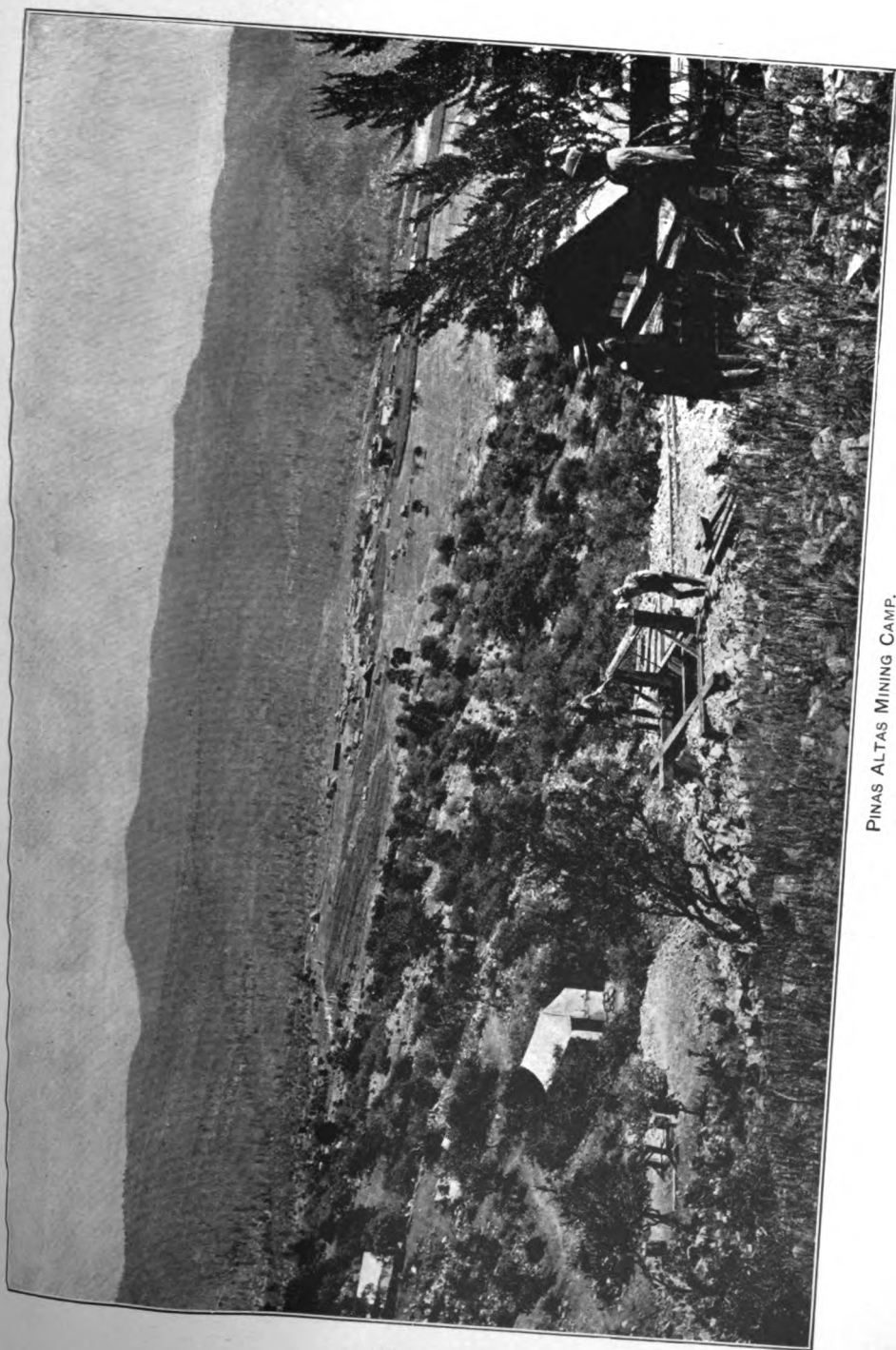
Pinos Altos.—The old Spanish records in the custody of the Mexican Government at the city of Chihuahua tell of the discovery of gold at Pinos Altos by Gen. Pedro Almendaris, one of the early commandantes of the Mexican fortress at Santa Rita, distant 12 miles east, and where were situated the famous Santa Rita copper mines. The first discovery

of gold by Americans was made on May 18, 1860, by Messrs. Birch, Shively, and Hicks. The camp was first called Birchville, in honor of Birch, who was the first to find the precious metal. Within six months 700 men were in camp looking for the golden lucre. In 1861 quartz mining was commenced, the Atlantic and Pacific lodes being located. Many other quartz veins were immediately located, the ores being reduced and the gold recovered by grinding and amalgamation in arrastres. From twenty to fifty arrastres were kept in constant operation until 1866, producing in the neighborhood of \$300,000. Adding to this the gold produced from the placers, and the total of gold produced in the first five years would amount to over \$500,000. Considering the crude facilities for operating the mines and the perpetual dread and uncertainty caused by frequent Indian attacks, it was a remarkably good showing. In 1866 a 15-stamp mill was erected by Virgil Marston. This, the first modern machinery in the camp, was quickly followed by other mills of the same kind, which were kept in constant operation upon the oxidized, free-milling ores from the surface of the veins. As depth upon the veins was attained the sulphureted ores were encountered, which proved a serious obstacle to the amalgamation of the gold by the processes then in vogue. In 1883 concentration of the sulphurous ores was attempted by Messrs. Place & Johnson, but the process was a failure for lack of experienced operators. In 1884 Peter Wagner made a success of the concentration process upon the ores of the camp, and the same year Messrs. Bell & Stevens purchased and put in successful operation the Place & Johnson concentration plant, which had heretofore been pronounced a failure. From that time until last year the ores have been worked by amalgamation and concentration of the tailings, the concentrated product being shipped to the smelting works.

The Bell & Stevens properties, purchased more than a year since by the Hearst estate, are being worked vigorously and systematically, and they are producing good results. The drifts on the Pacific 500-foot level show 1,760 feet of continuous workings, which will give fully two years of ore in sight, or sufficient to keep a mill of 100 tons daily capacity in constant operation. All of the latest improved machinery is being used, and additions are constantly being made as the occasion requires. The property is under capable management, and the best possible results are being obtained. The Old Pacific mill, situated 1½ miles north of Silver City, which has been until about one year past operated exclusively on ores from the company mines, is now being run on tailings, and the results are highly satisfactory. About 4,000,000 pounds monthly of concentrates is the product, all of which is being treated at the Silver City Reduction Works. The tailings are not sufficiently high grade to bear railroad transportation, but being treated near home, their working has proven extremely profitable.

The Atlantic and Deep Down properties are being worked thoroughly, and satisfactory results are being obtained. Up to within a couple of years past these properties had not been made to pay, but by the introduction of new management and improved machinery they bid fair to rank among the best in camp. A considerable force is being employed in and about the mines and mill, and everything is kept going continuously. The new pipe line, put in a year ago under the efficient management of S. S. Murphy, of Denver, Colo., has more than paid for itself several times over.

The Golden Giant, one of the standbys of the camp, is being operated by F. J. Davidson with encouraging results. The ore chute on the 400 level has been struck 50 feet south from the shaft. A winze sunk



PINAS ALTAS MINING CAMP.

in the bottom of the 300 level shows the same ore body at a distance of nearly 400 feet south from the shaft. The rich ore, it is believed, is continuous between the two points, thus insuring a length of over 300 feet along the vein.

There are innumerable other properties in the camp, all more or less celebrated as producers, but they can not all be properly described within the brief scope of this article. Suffice to say that, all and singular, they are desirable properties, and many of them in years gone by bore enviable records as gold producers.

The long dormant mines of this district are proving to be the greatest copper and iron producers of New Mexico, and will ere long take rank with the greatest copper mines of the world. In the basin of Santa Rita proper, the Santa Rita Copper and Iron Company, of which Mr. Dawson is general manager, owns seventy-seven claims covering nearly 1,500 acres in area, which may be said to be one vast body of ore. The formation is an isolated peculiarity in geology. It is unlike any other mineral bearing area known. The copper ore intimately permeates every portion of the formation in an area of more than 1,000 acres. The ores are contained in what appears to be a comminuted porphyritic débris, originally disintegrated exclusively from a great porphyry belt, by seismic or volcanic action and afterward solidified into a secondary porphyry by the heat and pressure of a superincumbent mass of trachyte, which was again capped with limestone. In the basin of Santa Rita the limestones and underlying trachyte have been eroded, thus exposing the ore-bearing porphyritic zone just described. By reason of the moisture from below, which probably filled the cleavages as a vapor on the application of the superficial heat, the ore-bearing porphyry was not completely reindurated and is therefore more easily mined. The copper occurs as native copper throughout the rock mass, also quite extensively as cuprite. Here also are found considerable bodies of those rich and rare oxides, tenorite and melaconite, some of the shipments of these ores in carload lots running from 40 to 50 per cent pure copper. This vast ore body does not conform in any particular to the generally known conditions of structure that exist in other ore veins or deposits, but the ore is generally disseminated throughout the entire mass of rock. For a leaching or concentration process on a gigantic scale this is probably the greatest opening in the world, as it has been sufficiently developed to demonstrate that it is one of the greatest, if not the very greatest, body of copper ore in the known world. At present there are 150 men employed in the mines, most of them working upon the tribute system, paying a royalty to the company upon every ton of ore extracted and sold, the lower grade ore, thrown over the dump, reverting to the company to be profitably utilized at some future time when proper appliances are at hand. Every one of the many tributers (as the leasing miners are called) are making more than ordinary wages, besides paying a good royalty to the owners of the mines, who run no risk whatever. The production of ore from these mines last month was more than 600 tons, which averaged over 21 per cent copper at the smelting works where it was sold. This ore is only the selected grade; the balance of the rock extracted would undoubtedly pay handsome profits with the proper machinery upon the ground to properly concentrate or leach the ore.

The iron mines of the Santa Rita Copper and Iron Company under the control of the Hearst estate employ a large force of men and ship six cars of ore daily to the Pueblo, Colo., smelter. The iron is of the highest possible grade and is readily sought by smeltermen for fluxing

purposes. The output of these mines will be greatly increased in the near future.

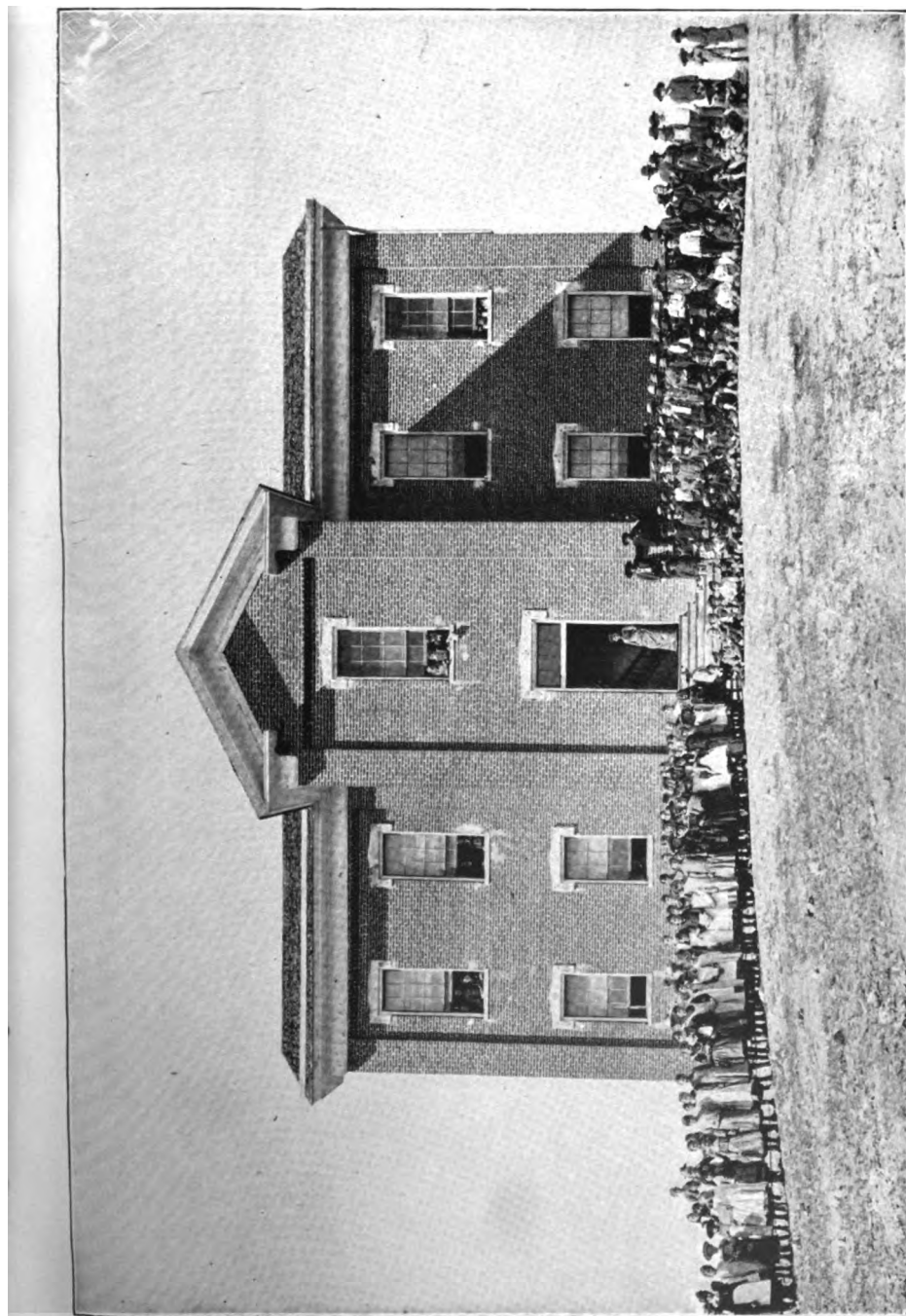
Hanover.—The copper mines of this old camp have lain idle for a number of years, or, if worked at all, only in a desultory manner. Now, however, they are being worked vigorously, and they are on a paying basis once more. In the old Hanover mine a big body of copper average ore has been shipped to the smelter which yielded 14 per cent. One hundred and eighty thousand dollars' worth of ore has been taken out of this property during the last few months, and as the mine is being exploited additional bodies of ore are being uncovered. The working force is being augmented as opportunity offers, and the entire force of workmen now employed are all engaged taking out pay, no dead work being necessary.

Central.—Situated about 7 miles due east from Silver City is one of the most important mining camps in Grant County. It is essentially a poor man's camp, the ores, many of which are near the surface, being unusually rich in the precious metals. Silver and lead, however, predominate, but gold, both quartz and placer, is found in paying quantities. A few years ago a find was made on the Scotch Lass, which can only properly be described as gold carrying some quartz. So rich was it on the surface that miners made good wages by washing the dirt for several yards below the vein. The richest of the ore was pounded up in a mortar and washed like coarse gravel.

The leading mine in the camp is the Texas, which has been a famous producer from the grass roots, and has up to date proven a wonder. The mine lay immediately across the trail leading to Silver City, and had been crossed and recrossed by miners and prospectors thousands of times in the past twenty years, but it remained to be discovered by a rancher, who at the time could hardly distinguish the difference between a piece of mineral and a charcoal deposit. But, he was suspicious, and as subsequent investigation proved, his suspicion was well grounded. This, then, in common with many other noted discoveries, bears out the adage usually attributed to tender feet, and in this instance the wonderful Texas mine was the result. The mine until quite recently has been worked spasmodically by the crudest kind of machinery, yet under that system it has paid the various parties engaged in working it handsome returns. Under its present efficient management, and by the use of the latest improved machinery, it still maintains the lead, and has proven a source of profit to its present owners. The shaft has attained a depth of 400 feet, and the bottom shows up good ore and a strong vein. The first carload of machinery for the new mill has arrived and is being put into place rapidly. The mill will have a capacity of 40 tons daily. The ore is mostly a heavy silver sulphide, freely showing native, and carries gold in paying quantities.

Lone Mountain.—In the central mining district, has in past years produced large quantities of high-grade silver ore, and, at the present prices of silver, continues to be a payer. The properties are only being operated in a small way at present, but occasionally surprisingly rich pockets of ore are encountered. Only a few mines are being worked now, but should silver ever become rehabilitated or ever reach 90 cents, they could be extensively and profitably worked on a large scale.

Carlisle.—But little has been done for the past two years in this once famous gold camp, but there are signs of its rejuvenation. The extensive milling plant of the old company, once the finest in the Territory, has been allowed to be scattered, many of the more valuable parts of the machinery having been disposed of during the different manage-



SILVER CITY PUBLIC SCHOOL.

ments. When the workings had attained a depth of 550 feet, and water had been encountered in great quantities, the ore was found to be exceedingly refractory, and various schemes were devised to work the mine successfully, but all of no avail, and the company, becoming disheartened, abandoned the property almost entirely. There are those, however, miners who worked on the claim from first to last, who insist on declaring that the mine is all right and will again make its mark as a producer. Numerous other properties, all more or less noted, are to be found in the camp, and the owners, with true Western grit, propose to stay with them until the millennium arrives or old Carlisle is resurrected from oblivion.

Gold Hill.—Never since the discovery of the camp in 1884 has there been so little activity displayed as within the past year. The mines are as good as ever, if not better, as greater depth is reached, and the claim owners are as sanguine of wealth to-day as they were fourteen years ago. For some unaccountable reason the camp appears to be undergoing a sort of Rip Van Winkle experience which, apparently, it is difficult to shake off.

Turquoise.—Fourteen miles west of Silver City, on the east slope of the Mangas Valley, are situated, in the foothills of the Burro Mountains, the turquoise mines of Grant County.

The many small mountain ranges are cut deeply by water, forming many canyons. These ridges were originally formed by granite, the same being composed of quartz, feldspar, and mica.

To-day the rock forming these hills would not be called granite, the mica having disappeared and the feldspar decomposed into kaolin. In this rock occur several zones which contain the turquoise. They are of different width, the size above forming a layer of from 12 to 30 feet in thickness. This soil is unquestionably the result of decomposition of organic matter, which furnished the phosphoric acid, the principal constituent of turquoise, and this acid penetrated into the underlying rock, filling the cavities made by kaolin, and producing turquoise.

The zones or veins containing turquoise have different width, strike, and dip, and there is not a shadow of regularity about it, as it takes constant prospecting and observation to find the proper layers, especially the more valuable ones, as turquoise is valued according to color and hardness. Since times unknown dumps have existed in these gulches and were known to old prospectors, but no one paid any attention to them, as no ores were seen near by and turquoise was unknown.

In one canyon is an old tunnel and dump containing earthenware, showing conclusively that people long ago must have mined for turquoise here.

In 1890 the present Azure Mining Company obtained title to many claims around these hills, and has mined since then steadily without interruption. The result of their enterprise is unknown, as the company does not give out any statements regarding finances. It is supposed, however, that the mines pay a fair profit, as the management has never stopped a day in the last eight years.

The mines have been very intelligently opened and worked by the present manager, who takes great pride in having everything in the best possible shape, and even has beautified the grounds by a park in that desolate country. Around the groups belonging to the company a great number of claims have been located, and probably in the course of time these claimants may have as good property as the company.

There are other turquoise properties in the Little Hatchet Mountains, near the camp of Hachita, which a few years ago were profitably

worked, but at the present writing reliable data is not obtainable. It is known for a fact, however, that stones to the value of \$20,000 have been extracted and that valuable stones are frequently encountered, but their extent is not generally known to the world at large.

LIVE STOCK.

The cattle interests of Grant County are by no means an insignificant feature of wealth, amounting as they do to a considerable sum of money yearly to the thrifty stock grower. Grant County is by far in the lead of any other section of the Territory in this important industry. The shipments for a number of years past have been unusually heavy, that of 1897 aggregating in round numbers \$750,000 in value. Silver City is the largest shipping point for cattle in southern New Mexico, and during the busy season the festive cow puncher is a familiar sight upon the streets. The stock yards south of the city are large, easy of access, and supplied with all the modern conveniences. Stock from all the northern and western sections of the county ship from here, as also frequent shipments from southern Socorro County. The Santa Fe system pays special attention to this large and lucrative branch of their business. The recent rise in the prices for beef cattle, incidental to the Hispano-American war, has proven an incentive to stock growers, and they are consequently giving the subject of better beef their strictest attention. The stock cattle of this immediate vicinity are of a high grade, and the profits are accordingly great. The shipments up to date this year have been enormous, and should the demand keep pace with the supply the year 1898 will far exceed any previous record. Prices have been the very best, ranging from \$18 to \$20, and \$22 for yearlings, twos and threes. The ranges, both mountain and valley, are exceptionally good this year, as rains have been abundant and cattle had fared well during the winter last past. Sheep and goats, of which there are quite a number in this county, have proven remunerative to their owners as food producers, while the wool and cashmere fleeces have been disposed of at fancy figures. The stockmen of this section all wear smiling countenances, and some of them, diamonds. Their bank rolls have increased amazingly during the past six months, and fall sales promise to greatly add to their already plethoric purses. Cattle passed through the winter well, and the calf crop this year is better than it has been for the past ten years. The outlook is decidedly encouraging, and the stockmen accordingly in happy spirits.

Hog raising has hardly as yet become a distinctive industry, although there are several small concerns in operation in the Burro Mountains, where mast is plentiful. A few farmers along the Middle Gila who raise corn extensively, and who have no immediate market for their crops, put it into pork, which readily brings 5 and 6 cents per pound in Silver City.

There are a few extensive horse farms in the county, but they are mostly conducted in connection with the cattle ranches, as riding ponies are a prime necessity to the cowman, and are constantly in demand to replace worn out and aged stock.

HOT SPRINGS.

There are a number of mineral springs in the county, some of which have proven to possess remarkable medicinal qualities. The celebrated Hudson Hot Spring, located about midway between Silver City and Deming, on the line of the Atchison, Topeka and Santa Fe Railroad,

has already achieved a wide reputation as a health and pleasure resort. The temperature of the water registers 142° F., and is almost a sure cure for rheumatism, blood and kidney diseases, and various other complaints.

The hotel accommodations are of a superior quality, and during the summer months no more delightful pleasure resort can be found in the country.

The Gila Hot Springs, 50 miles north of Silver City, are much sought for their medicinal qualities, but the accommodations are not as good as they might be. Camping, hunting, and fishing parties to the higher Mogollon country frequently make this a stopping place, and the ladies of the party enjoy themselves here while the men folks go up into the mountains after large game, which can be found in abundance.

AGRICULTURE.

The agricultural resources of Grant County are but little developed, and yet the area under cultivation would supply an abundance of food products for the inhabitants of the county if properly managed and cared for. The principal agricultural section of the county at present is on the Mimbres River, a small stream situated in the eastern portion of the county. There are now about 20,000 acres under cultivation upon this stream, which furnishes the water for irrigation. It is proposed to build a system of storage reservoirs which will store sufficient water to irrigate 100,000 acres of the choicest land in the West, which lie just below the site chosen for the main dam. The company is composed of Chicago capitalists, and is known as the Rio Mimbres Dam and Irrigation Company, with C. L. Wuelff as resident manager. The company now has a lesser experimental irrigation system at work and has 1,000 acres of land under cultivation. Here there is found the first producing canaigre farm in the United States. The cultivation of this crop is bound to soon prove a profitable and extensive industry, as it has been fully demonstrated that the valley of the Mimbres produces canaigre of superior quality to that grown in any other part of the world. The poorest of the many samples analyzed for the Rio Mimbres Dam and Irrigation Company gave returns of 30 per cent of tannic properties, while the canaigre tubers grown in other localities give 11 to 25 per cent of tannic values. This company has 200 acres in canaigre. A contract has been made with the California Canaigre and Extract Company, an English company, for the sale of the entire product at \$6 per ton for the green tubers, the purchasers to dig, dry, and sack the product, the farmer to furnish teams for plowing up the tubers and to transport them to the railroad when dried, ready for shipment. As the canaigre tuber at two year's growth produces 12 tons per acre, it is plain that a canaigre crop is a very valuable one, and is obtained with less labor than is generally expended on other crops which give anything near as good cash returns.

There are thousands of acres of orchards upon the Mimbres producing fruit of superior quality, the peaches and apples competing successfully with those raised in the States, as in fact many carloads of apples especially have been shipped to the East and to Arizona. Fruit grown in the foothills of the Mimbres Mountains may have equals elsewhere, but superior it would be difficult to encounter. Of the smaller fruits and berries an abundance is raised, so much so that the home market is continually glutted. A fortune awaits the happy man who, having the means, has the business foresight to erect a canning plant in that neighborhood.

On the Gila River, to the north and west of Silver City, there are about 5,000 acres under cultivation, one-fifth of which is operated by the Gila Farm Company, which, besides raising all of everything required for home consumption, produces all kinds of fruits of the finest grades obtainable anywhere. A small apiary on this farm produces 10 tons of honey annually. With storage reservoirs and dam properly constructed the area of tillable land along the Gila could be increased to 50,000 acres.

GUADALOUPE COUNTY.

Guadalupe County, the banner grazing county of the Territory, with hundreds of thousands of acres of land of the very finest for settlement, offers unexcelled opportunities to the home seeker. Almost the whole eastern part of this county, embracing part of the so-called Staked Plains, is covered with the finest of grama grass. Water is found here within a few feet of the surface, and it needs only the master hand of man to create a veritable paradise.

As a sheep country Guadalupe County is in the lead of all. The finest improved Merino herds are found here, and the wool produced is without doubt the best in quality and strength of staple. Next to the sheep industry comes that of the cattle, both of which are successfully carried on here.

The agricultural crops of Guadalupe County are alfalfa, fruit, and cereals. Apples and pears raised here excel in flavor and size similar fruit raised in California.

As yet little efforts have been made to develop irrigation enterprises. In this direction most excellent opportunities are offered, especially at Fort Sumner, where 12,000 acres of land could be irrigated at nominal cost.

Puerto de Luna is the county seat of Guadalupe County; has a \$20,000 court-house, four good stores, and other modern buildings. The elevation is 4,000 feet; the situation is in an extremely picturesque valley on the Pecos River; the climate is mild and delightful in the winter as well as in the summer.

The mineral land found embraces gold, silver, copper, coal, and iron. The coal found is of good quality.

Oats, potatoes, barley, and timothy are chiefly grown, and the ranch houses for live-stock raising are numerous. This locality of New Mexico is especially adapted to the raising of horses.

As a health resort this locality has become famous. The scenic effects are grand. The country is wild and broken, and much game abounds, including bear and deer, while the streams are literally alive with the finest mountain trout, running as high as 5 pounds in weight.

Splendid pine forests cover the mountains and mesas, and the timber industry is an important one.

LINCOLN COUNTY.

The following data was furnished by Mr. G. W. Pritchard:

Lincoln County extends from a point north of the base line of the Territory south to the State of Texas. The county is one of the large counties of the Territory, and within its boundaries it contains both mountains and prairies. The most prominent ranges are the White Mountains, El Capitan Mountains, White Oak Mountains, the Jicarilla Mountains, and a portion of the Sacramento Mountains. There is a population of about 10,000 in this county, devoted to horticultural, agricultural, pastoral,

and mining interests. The mountainous section of the county, with one or two exceptions is well watered. In the White Mountain range there are a number of perpetual streams that flow the year through, and upon which are many prosperous farms. The Rui Doso, the Tularosa, the Bonito, and the Hondo are a few of the streams that flow from this range of mountains. The mountains themselves are among the highest in the Territory, and, besides furnishing many streams of water, are well timbered. It is within this range that the Mesalero-Apache Reservation is located, and on the Rio Bonito, among the foothills of the White Mountain range, is also located Fort Stanton, where the Government for many years kept its troops quartered. Here is one of the prettiest sights in the whole Territory. An effort has been recently made in Congress to pass this fort and improvements to a society of physicians to be converted into a sanatorium. The locality is recommended for invalids, and especially for those who are suffering from pulmonary troubles, as being a place well adapted to the promotion of health.

El Capitan range is also splendidly watered and timbered. It is at the foot of this range, on the north side, that the El Capitan Land and Cattle Company is located and where it is said they have about 40,000 head of cattle.

The Sacramento range, a large portion of which lies in the county of Donna Ana, is also a magnificently timbered and watered country. Several fine streams flow from this range, both to the east and to the west; those flowing to the east emptying into the Pecos and those flowing to the west sinking into the sands of the plains. It is into this range of mountains, from the west side, that the El Paso and North-eastern Railway Company has recently constructed a branch road. The Penasco country, leading from this range to the east, is a fine agricultural country. Along the streams of this section are many prosperous farmers.

FARMING.

The principal streams upon which farming is carried on are the Rui Doso, Tularosa, Bonito, and Hondo. Fine crops are produced upon these streams every year. There is probably no country that produces a better class of fruit, especially apples and the hardier fruits, than these valleys. The fruits of the Coe Brothers, on the Rui Doso, are noted far and wide for their flavor and quality, and the time is not far distant when Lincoln County will be noted for the excellent quality of peaches and apples, as well as other fruits it can produce.

PASTORAL.

The prairies that sweep down from these mountain ranges, embracing thousands upon thousands of acres of land, are covered with the finest grasses in the world. The grama grass is conceded by stockmen to be the most nutritious grass that grows upon the prairies. Lincoln County has no equal in the Territory in respect to this kind of grass. The country at this season of the year is covered with it, and stock of all kinds are rolling in fat. This county is a stockman's paradise, and the stock raiser here is in a most prosperous condition. Sheep have more than doubled their value to their owners since the passage of the Dingley tariff law, and the same may be said of the owners of cattle in this county. The ranges are not overstocked, as they are in some localities, and, as a consequence, live stock are generally in a good condition the year through.

MINES.

But, after all, perhaps the most important interest in this county is the mining industry. The reputation of Lincoln County for rich mines is not confined to the Territory. It abounds in rich coal fields and in gold, silver, and copper; but the prevailing precious metal is gold. The White Mountains, El Capitan Mountains, the White Oaks Mountains, the Jicarilla Mountains, and the Gallinas range are one vast field of developed and undeveloped mineral wealth. Probably the most wonderful mineral deposit of gold ore in the Territory is to be found in the Hopeful mine, on the Rio Bonito, in the White Mountains. Here is an ore shoot that takes in a large portion of the side of a mountain. The extent of the ore is so great, that in mining it the rock is quarried rather than removed by the ordinary methods of mining. It is free-milling, and although the rock is not high-grade ore, yet its volume is so great that as a mining proposition it is considered one of the big properties of the county. Then, in the same range of mountains, there are the American, Helen Rae, and other mines near the town of Nogal that have developed into rich mines. Seventeen miles north of these mines is the famous gold-mining camp of White Oaks. Who has not heard of the Old Abe mine, of the North and South Homestake mines, the Little Mac, and other mines at White Oaks, the great bullion pro-

ducers? Millions have been produced by these mines, and yet the camp has only made a beginning. The coming of the railroad will make another Cripple Creek, as an ore producer, of the White Oaks country. North of White Oaks 10 miles are the famous Jicarilla gold placers. There are no placer fields in New Mexico so rich as they. A country from 10 to 15 square miles is a field of gold; that is to say, the whole of this Territory contains rich placer dirt, and notwithstanding the fact that there is no running water in that vicinity, and that mining is done with dry washers and by hauling water a long distance, immense wealth is taken from this locality every year. One of the new enterprises of Lincoln County, now being matured, involves the piping of water from El Capitan Mountains, already referred to, a distance of 22 miles, to these placers. When that is accomplished, it will mark a new era in placer mining in Lincoln County, for it is certain that millions of dollars in placer gold will be taken from these diggings when water is placed upon the grounds.

Lincoln County offers great inducements in all lines of industries, of which it has so many. The coming of a new railroad; the opening of so many valuable mines; the discovery of such vast coal fields, containing the best quality of coal, and the revival of the live-stock industry insure for Lincoln County a prosperous future.

MORA COUNTY.

The county of Mora, bounded on the east by Union County, on the north by Colfax, on the south by San Miguel, and on the west by Rio Arriba and Taos counties, has an area of over 2,000 square miles, consisting of well-watered and as fertile and productive agricultural and horticultural, as well-grassed pastoral, as rich mineral, and as densely wooded timber lands as can be found in any other locality in the great Southwest.

A choice of remunerative occupation is offered to either the farmer, gardener, or stockman; or, should the home seeker prefer to prospect for mineral or be a lumberman, he can find among the mountain ranges of the western portion of the county, on Government land, free and open to all comers, sufficient inducement for that necessary labor which accumulates wealth in bringing to light the hidden treasures of the hills or in felling the giants of the forest.

The eastern portion of this county, all public domain, is entirely devoted to stock raising. The great plains lying between Union County and Red River support numerous herds of sheep, aggregating hundreds of thousands, during all the year. This immense stock range is well watered, and, with sufficient shelter afforded by the many brakes and canyons, comes near to being the stockman's ideal of what a summer and winter range should be. The grass is black grama, well known to be the most nutritious of all grasses.

From Red River westward the country is broken by cedar-clad hills and open parks and glades; is dotted with picturesque stock ranches and small farms until the lower valley of the Mora River is reached at Cherry Valley, from which point to the head waters of that river large tracts of land are farmed, and all under irrigation systems, yielding heavy crops of alfalfa, the principal forage plant grown. Other crops successfully raised are meadow hay, oats, wheat, corn, and in fact all small grains give a greater return per acre in bushels, and many more pounds to the bushel, than any of the famous wheat or corn States.

From Watrous to the western boundary line of Mora County, on all the streams and throughout all the many beautiful valleys, very large amounts of grain and hay are annually harvested. Las Vegas, in San Miguel County, is as yet, and has been for decades, the principal market and distributing point for all crops raised in the upper Mora and tributary valleys, as well as the receiving and distributing point for all material timbers used by the Atchison, Topeka and Santa Fe Railway, and sent for hundreds of miles, north and south, over its line.

The town of Mora is the county seat, and is situated in the midst of extensive valleys, thickly populated with prosperous and industrious inhabitants, the visible evidence of whose labor contributes in a marked degree to the prosperity of the community at large, and with the remarkable result that not less than 40,000 wagon loads of products of the farm and forest, and of merchandise, agricultural implements, etc., are exported and imported annually.

As yet railroad communication between Mora and the outside world is lacking, but recently there has been incorporated the Las Vegas, Mora and Taos Railway Company, with principal office at Las Vegas, which intends to link those towns named in its title and bring them into close connection by means of a standard-gauge electric railway, thus giving to Mora all the advantages of being practically on a trans-continental line, through Las Vegas, on the Atchison, Topeka and Santa Fe Railway as a gateway. The early construction of this line is almost an assured fact.

The opportunities for investment in Mora County are unsurpassed in the Rocky Mountain regions. To either the large or small capitalist, the millionaire or the "man with the hoe," there are presented openings for the safe employment of money which will in manifold manner repay all judicious outlays.

With the construction of the proposed railway will immediately follow the installation of immense beet-sugar refineries, canning establishments, flour and oatmeal mills, saw and planing mills, and various other important industries, raw material for which will come from the surrounding country. One item alone, i. e., peas, will furnish to a cannery over 1,000,000 pounds per annum, equal to as many cans as pounds, and of as fine a quality and delicious a flavor as any imported French peas. The Mora pea can be bought for 1 cent per pound, and it requires but little arithmetical effort to figure between the cost and profit on an article at 1 cent per pound for raw material and 25 to 30 cents per can for the merchantable product. Beans in great quantities are also grown in all the valleys of western Mora County, and they will assuredly prove an additional industry to that of canning peas, especially as the New Mexico market is now clamoring for both of them. A very heavy export business can be transacted, and both canned peas and beans will readily sell in all eastern cities.

The La Cueva Ranch Company has successfully proven the entire suitability of the Mora Valley soil for sugar beets, and last year (1897) planted a small tract which produced the astonishing tonnage of 22 tons per acre, which on analyses made by the chief chemist at the Territorial agricultural station at Mesilla Park, N. Mex., and by the chief chemist of the Agricultural Department, at Washington, D. C., showed, respectively, 19.7 per cent and 19.4 per cent of saccharine matter per ton of beets. The La Cueva Ranch Company has a standing offer to supply the crop off not less than 3,000 acres of beets for a first-class refinery located anywhere in the immediate vicinity of the ranch, which would be two-thirds the tonnage required by a 100,000-ton plant. The tonnage lacking for such an establishment can easily be furnished in close proximity, and an exceptional opportunity is hereby opened to large capital to come and invest.

The amount of oats annually raised in the upper Mora Valley alone often exceeds 10,000,000 pounds, while of wheat 2,000,000 pounds is regarded as only a moderate yield. The following figures are taken

from the books of merchants at Mora, and set forth the exports and imports of that town only, for last year:

Wheat.....	pounds..	2, 500, 000
Oats.....	do.....	8, 000, 000
Corn.....	do.....	500, 000
Hay.....	do.....	2, 000, 000
Alfalfa.....	do.....	1, 000, 000
Sheep.....	head..	100, 000
Wool.....	pounds..	500, 000
Peas and beans.....	do.....	2, 000, 000
Lumber.....	square feet..	2, 000, 000
Piles.....	linear feet..	200, 000
Railroad ties.....	do.....	200, 000
Cattle.....	head..	2, 000
Imports of merchandise, agricultural implements, etc.....	pounds..	4, 100, 000

But in this connection it is only just and right to state that the area of land actually under the plow is but a mere patch compared to the whole area of the county, which statement is necessary to explain what would otherwise appear an extreme paucity of agricultural products. There are at least 500,000 acres of rich lands lying idle and uncultivated, all of which can be put under irrigation systems in the valleys of the Mora, Rio de la Casa, Sapello, Manuelites, Cebolla, Coyote, Rito, Agua Negra rivers, and several minor streams, all of which rivers and streams carry strong heads of never-failing water.

Fruits of all the hardier varieties grow both wild and in orchards in extravagant profusion; they also offer special inducements for the establishment of preserving or canning works.

In minerals the various sorts in constant demand for smelting purposes are abundant. Some of the finest specimens of copper ore ever brought forth from the treasure vaults of the Rocky Mountains are to be obtained in western Mora County. There is also gold-bearing ore, iron, galena, and other sorts awaiting exploitation and intelligent work of the prospector and miner to show their extent.

Coal of a semianthracite character has recently been discovered in apparently inexhaustible measures which are of sufficient thickness and of such excellence as to establish their commercial value beyond all peradventure. When railroad transportation has been provided, Mora County coal will become known all over the West as a strong competitor in "black diamonds" with any other portion of the country.

The population of Mora County is not less than 17,000 souls. Its assessed valuation is about \$1,200,000, being probably only one-third of the actual value.

The altitude runs from 6,000 feet above sea level to 10,000 feet, or perhaps a little higher on the mountain peaks.

The climate is similar to the rest of the northern part or plateau land of New Mexico, and surpasses that of any other country on the face of the globe for counteracting and curing all sorts of pulmonary complaints.

The scenery in the mountains is acknowledged to be superior to the Swiss Alps by those people who have seen both.

The hunter's paradise and the fisherman's ideal for trout fishing is here to be found; the many mountain streams abound in speckled beauties, while game, both feathered and furred, small and large, roams the hills on all sides.

The home seeker can purchase lands already under cultivation for \$20 per acre and upward. Farming pays when such lands will readily and constantly yield 50 bushels, or 3,000 pounds, of wheat per acre, which is now selling on the ground at 1½ cents per pound, and never

less than 1 cent, with a surety of no failures in crop on account of irrigation.

Many other farm products are raised in this county, and of late years potatoes have been most successfully grown; so much so as to enter into active competition with both California and Greeley, Colo., bulbs in the home markets.

Vegetables of almost every known variety are grown throughout all the valleys and on all the farms in Mora County. Cabbages of 40 to 50 pounds weight, as solid and sound as can be imagined, are common results of the gardener's toil. The soil seems peculiarly well adapted to onions, carrots, parsnips, turnips, radishes, lettuces, and garden truck of all sorts attains speedy maturity, taking the place of and driving out of local markets all importations of vegetables from better known parts of the West, on account of the superior flavor of the home-raised article. Celery flourishes in this county; large quantities can be raised for export in addition to meeting local demand.

In natural but as yet undeveloped resources, Mora County can produce a great and varied abundance. Excellent clay for brickmaking, red and white sandstone, limestone, products of the forest, white pine, red and white spruce, cedar of sufficient growth for electric, telegraph, and telephone poles, and many other trees of commercial value all grow in great quantity and of remarkable thriftiness.

There is enough timber in western Mora County to build a railroad round the earth; enough white spruce to supply a very extensive paper mill, or several of them, with raw material for years to come. There is coal in endless amount for fuel for manufactories, canneries, beet sugar refineries, etc., and raw product sufficient to supply their demands and keep them steadily in operation from the very moment they are ready to commence.

Excellent natural wagon roads, kept in good repair, cover the county with a regular network. All means of travel and transportation is now maintained by vehicles only, except where the Atchison, Topeka and Santa Fe Railway cuts across the county from Wagon Mound to Watrous, some 40 miles of line.

There is no county in New Mexico which presents so diversified a field for the safer employment of capital in large or small sums than Mora does. Good management, abundantly aided by fertile soil, permanent water for irrigation, and intelligent farming, will produce almost incredible results; the land requires no artificial fertilizer, as the water used in irrigating attends to renewing the soil every year, or just as often as irrigation is given the lands and crop.

To first realize and afterwards appreciate what Mora County can show and offer to the world, personal inspection and investigation are absolutely necessary, as its most fruitful portions and choicest locations lie remote from the present railway and are not seen or even heard of outside their immediate environs.

RIO ARRIBA COUNTY.

Rio Arriba County lies between the counties of Santa Fe, Taos, San Juan, and Bernalillo, and is bounded by the State of Colorado on the north. Its area is about 4,500,000 acres, of which over 2,000,000 acres are available for farming and pasturing purposes, agriculture and stock raising being the occupation of seven-tenths of the population, which, according to the last official census, is 11,534, although a recent estimate places it at 18,500.

EDUCATION.

The county of Rio Arriba has as many, if not more, public schools than any other county in New Mexico, and all are well conducted and largely attended. There are 43 school districts with an enrollment of over 1,201, and an average attendance of 623 males and 400 females.

The principal towns of this county are Tierra Amarilla, the county seat, with a population of about 2,000, a good court-house, modern-built jail, three good stores, and a branch of the Denver and Rio Grande Railroad. The other principal towns, which are all thriving, are El Rito, Chama, and Monero, the last being a coal-mining town.

Irrigation is practiced wholly, there being no less than 40,000 acres of land under ditch.

There are two very extensive and exceedingly fertile valleys, the Rio Grande Valley and the vast strip of land along the Chama River from its source to its junction with the Rio Grande, 3 miles above Espanola. These are the fruit regions of this county, and the water for irrigation of the fruit lands is furnished by the Rio Grande and Chama rivers.

MINING.

The mining industry is also carried on very extensively in Rio Arriba County. Rich galena ore has been found, running \$40 in silver and 30 per cent in lead, within 8 miles of the Denver and Rio Grande Railroad, which railroad crosses the county of Rio Arriba in its northern part from east to west. Gold has been discovered at Tierra Amarilla in good paying quantities; copper and coal, very rich, have been found in the neighborhood of Abiquiu, in this county. All along the Chama River gold placers in large and paying quantities have been discovered; also on the Chama River near Abiquiu, covering an area of 16,000 acres. There are now three mining districts, i. e., Good Hope, Eureka Gulch, and the Headstone within the county, which are considered by mining experts equal in rich ores to the famous Creede district of Colorado.

VALUATIONS.

The value of property is \$856,822. There are 1,550 cattle, valued at \$13,002; 127,869 head of sheep, valued at \$103,725.85; 1,082 horses, valued at \$14,023, and 67 mules, valued at \$1,571.

FRUIT.

Fruit of the finest flavor is grown in this county, is free from defect, and is very abundant.

SANTA FE COUNTY.

Santa Fe is one of the smallest counties in the Territory, but by reason of its position on railroads, the size of the towns within its boundaries, and the fact that the city by the same name is the Territorial capital, it occupies the first place of importance among all the counties of the great commonwealth of New Mexico.

Geographically the county is located in the center of the Territory from east to west, with the northern line on the thirty-sixth degree of latitude, and extends south a distance of 72 miles, or somewhat below the thirty-fifth degree. It is 30 miles wide, and has a total area of 1,498,600 acres, of which 975,000 are irrigable, arable, or fit for pasture.



MOUNTAIN SCENE IN NEW MEXICO.

The Rio Grande River flows through the northwest corner from the northeast to the southwest, and numerous smaller streams, tributaries of the Rio Grande, complete the natural water system. The Atchison, Topeka and Santa Fe Railroad runs through the center of the county east and west, and the Denver and Rio Grande Railroad enters from the north and runs south for a distance of 35 miles, terminating at the city of Santa Fe. These lines of railroad give eastern connections and furnish an outlet for the products of the ranches, orchards, and mines.

TOPOGRAPHY.

The surface of the country is beautifully diversified. Mountains, valleys, and mesas break the contours. On the eastern boundary the main range of the Rockies breaks the winds from the vast prairies to the northeast and exerts a great influence over the climate, rendering the summers cool and the winters mild. To the west the lofty heights of the Jemez and the Valle mountains serve the purpose in fending the valleys from the winds and storms from the northwest. The altitude varies from 5,000 feet in the southern portion of the county to 7,000 feet at the city of Santa Fe. In the valleys the fertility of the soil is wondrous, and when placed under irrigation produces bountiful crops; the mesas provide forage for herds of cattle and sheep; while the mountains are filled with gold and other valuable metals and semi-precious stones.

WATER AND IRRIGATING.

In the northern part of the county the Rio Grande River furnishes a never-failing supply of water to irrigate thousands of acres of valley lands, and a failure of crops is something unheard of. In the Santa Fe Valley the average flow of the Santa Fe River is sufficient to supply every need of a dense population, but on account of the rapid fall of the land flood waters soon run out of the stream and are lost. The one great need of the valley is storage reservoirs in which to catch this waste and reserve it for the dry seasons. One large reservoir has been completed with a capacity sufficient to irrigate not less than 5,000 acres, but there are thousands of acres of valuable lands that are not yet under ditch. A beginning has been made, and the time is not far distant when all the lands suitable for cultivation will be under water. A great stimulus has been given the matter of irrigation the past year by experiments that have been made in the growing of sugar beets, which have met with flattering success.

HORTICULTURE AND AGRICULTURE.

Horticulture has been attended with great success. In the northern part of the county, in what is known as the Espanola Valley, in and around Santa Fe, at Tesuque, and in the different valleys where water can be put on the land, large orchards have been set out and many of them are in bearing. The first attempt to grow fruits was made by the Right Reverend Bishop Lamy sixty years ago, and the results of his efforts in that line are to be seen on every hand. The quality of the fruit raised can not be excelled by even the far-famed products of California, and, wherever shown, Santa Fe County fruits have carried off the prizes against all competitors. The varieties grown with the greatest success are apricots, peaches, pears, apples, nectarines, quinces, and all kinds of berries; nuts of different kinds also do well.

Grapes are grown to some extent, but on account of the altitude do not attain that perfection which accompanies their culture on lower lands.

Wheat, oats, corn, sugar beets, and vegetables are raised in all the valleys with success. In the Espanola Valley wheat is the principal crop, and the quality of the grain grown is equal to that of any country.

SUGAR BEET EXPERIMENTS.

The success in growing sugar beets in the Pecos Valley the past few years led to the thought that beets might be raised in Santa Fe County and early in the present year seed was secured and distributed among a number of the farmers in different parts of the county for the purpose of testing the adaptability of the soil and climate to that vegetable. It is now late enough in the season to know the results of the experiments made in this work. Every anticipation has been realized. The beets not only attain the desired size, but the yield is enormous. While an analysis for the per cent of sugar contained has been made, there is no question but it will equal that of the beets grown in the Pecos Valley which is over 18 per cent.

In the northern part of the county there is, as has already been stated, an unfailing supply of water to irrigate large bodies of land, and this question does not enter into the proposition in the valley along the Rio Grande River. In the Santa Fe Valley water has been provided for 3,000 acres, and the expenditure of a comparatively small amount of money will furnish water for more than double that acreage. It is of great interest to here state what 3,000 acres planted to beets will do toward the upbuilding of a city like Santa Fe, and also to speak of the advantages of the city as a point at which to locate a factory.

The average yield of 3,000 acres of beets, at a modest estimate, would be 30,000 tons, worth at the factory, at a fair price, \$150,000, mainly representing labor. The city of Santa Fe is so situated that virtually all the different crops can be handled by a factory located here. The first early-grown beets, grown in the Rio Grande Valley to the south of Santa Fe, or Atchison, Topeka and Santa Fe road, could be treated, then a second or later maturing crop from the same valley to the north, on the DeWitt and Rio Grande road, while the last and latest crop would come from the Santa Fe Valley. This method of raising and shipping beets from a central point would furnish a season's supply sufficient for a factory more than the average French or German capacity, during a season as long as any California "campaign."

One important feature of beet culture is abundant labor that can be secured just when needed. In that respect the county is placed in a most advantageous position. The necessary labor is already here and remains all through the year. Perhaps nowhere else in the Territory can to be found all the necessary conditions combined as at Santa Fe—land, water, sunshine, and labor—for the successful production of sugar beets and sugar made therefrom. All that is lacking is the factory, and from present indications it is safe to predict that within a few years, possibly within the next twelve months, the growing of sugar beets and the manufacture of sugar will constitute the one great source of revenue of the county.

MINERALS AND MINES.

In minerals Santa Fe County is one of the richest sections in the entire Southwest. Gold exists in large quantities in the southern part of the county, in what is known as the Golden and San Pedro districts, and a number of mines are in successful operation. Some of the rich

turquoise mines in the world are also located in this part of the county, and one New York firm has taken fortunes out of turquoise claims controlled by it. To the east of the city of Cerrillos a few miles are vast deposits of bituminous and anthracite coal, rivaling in quality the product of the eastern mines. This coal is now being mined by the Atchison, Topeka and Santa Fe Railroad Company, and the output supplies the needs of the company and a large market demand. Silver is also found in different localities, but these mines are not working at present, although in years gone by silver mining was one of the principal industries of the county. Lead deposits are found in connection with the silver, and this mineral is beginning to attract considerable attention from miners and mining men.

Developments made in the mines of the county in recent years have resulted in a demand for the treating of ores near the place of output, and several mills for that purpose have been erected, which are running constantly and employ quite a number of men. At this time a smelter and sampling works, with a capacity of 80 tons per day, are in course of construction at Cerrillos, and the works will be ready for active operation in less than sixty days. Other projects in a mining way are either under way or contemplated. The mineral wealth of the county has been known for many years, but it has only been within the past few years that any systematic work has been done, and the development of mining properties will be rapid in the future.

POPULATION.

The census of 1890 gave the county a population of 13,562, but an estimate recently made upon the returns from the last general election, held in 1896, shows a gain of over 7,000, and fixes the number at 21,000.

The principal towns and cities are Santa Fe, Cerrillos, Espanola, Madrid, Lamy, Galisteo, Santa Cruz, Golden, Glorieta, and Dolores.

SETTLEMENT.

The settlement of the county of Santa Fe is so intertwined with the history of the city of Santa Fe that that subject will be treated under the following head:

CITY OF SANTA FE.

Santa Fe, the capital of the Territory of New Mexico and the county seat of Santa Fe County, occupies an unique position among the cities of the United States on account of its age, the many historic dramas and tragedies that have been enacted within its confines, its climate, and location.

POPULATION AND CITY.

At the present time the population numbers about 8,000 people, of which number less than 2,000 are "Americans," the others being lineal descendants of the old Spanish conquerors, but as devoted to their country and as loyal to the Stars and Stripes as the children of the Pilgrim Fathers.

The modern city is one of many peculiarities and presents much that is of interest to the tourist and sight-seer, as well as to those in search of health. The greater number of the streets are narrow and crooked; the low, flat-roofed adobe houses of the sixteenth century elbow elegant modern structures of brick and stone, lending a charm to the old town which casts a spell over all visitors, making them wish the ancient

walls could speak and tell of what they have seen in all the years that have passed since the first Indian stepped upon the plat of ground now forming the plaza. Nowhere else in the United States can there be found so curious a combination of the past and the present as in the "City of the Holy Faith."

LOCATION.

The city is situated almost in the heart of the southern Rocky Mountains, at an elevation of 7,000 feet above sea level. The Atchison, Topeka and Santa Fe Railroad and the Denver and Rio Grande Railroad give communication with the outside world, the former with Chicago direct, 1,320 miles to the northwest; the latter with Denver, 404 miles to the north. These two roads render Santa Fe of easy access from both oceans, and a more delightful place to rest on a long journey can not be imagined.

CLIMATE.

Almost surrounded by lofty ranges of mountains, the valley in which the city stands is sheltered from winds and storms, perhaps as no other place in the land, and the climate can not be excelled. From the records of the United States Weather Bureau in the local office, covering a period of twelve years, it is learned that the average maximum temperature is as follows:

January, 38°; February, 44°; March, 52°; April, 60°; May, 68°; June, 78°; July, 82°; August, 80°; September, 72°; October, 62°; November, 49°; December, 42°. In the winter on the coldest day the thermometer rarely falls to zero, while in the summer the temperature was never known to reach 90°. Extremes of heat and cold are unknown, and the day when the sun does not shine all or part of the time is so rare as to cause comment in the public press. The atmosphere is dry and bracing, and the climate of Santa Fe is known far and wide for its beneficial effects in all cases of pulmonary troubles. In fact, a large part of the residents in the "American Colony" are those who came here to die, as their friends and families thought, but after living a few years in the mountain air have become living, healthy testimonials to the health-giving qualities of the climate.

COMMERCIAL INTERESTS.

Before the day of railroads (the Atchison, Topeka and Santa Fe road reaching the city in 1880) Santa Fe was the principal distributing point for the entire Southwest, and enjoyed a trade that extended over a territory of thousands of miles in area. In those "good, old days" trains of wagons carried merchandise from the Eastern markets along the old Santa Fe trail through the deserts to supply this enormous market, and wholesale houses rivaling many of the pretentious concerns in the large cities to-day, lined the plaza and principal streets. Frontiersmen, cattlemen, hunters, soldiers, Indian warriors, and citizens all congregated in the plaza upon the arrival of a merchandise caravan to hear the gossip of the States, which the mails did not bring, and to welcome returning friends and relatives who had made the perilous journey. With the coming of the Santa Fe road, which passed on to conquer the wild country and deserts to the south and west, these conditions were in a large measure changed. New towns sprang up as if by magic, other marts of trade were established, and the short time in which goods could be secured from the East deprived the city of her commercial

supremacy. To-day there are large retail establishments doing a considerable volume of business, and several wholesale houses supplying a large scope of country with merchandise, and while former glories have departed never to return, Santa Fe is a place of importance in the business world.

CIVIC SOCIETIES, SCHOOLS, AND CHURCHES.

While the gentlemen of the city can not be classed as "jiners," several secret orders have large memberships. Among the societies represented are: The Masons, Odd Fellows, Knights of Pythias, Woodmen of the World, and several other mutual aid organizations.

REPORT OF THE WOMAN'S BOARD OF TRADE.

The Woman's Board of Trade has very recently passed its sixth anniversary.

The founder of this organization is Mrs. Cora L. Bartlett, wife of the present solicitor-general.

The object of the organization is for advancing every interest pertaining to the welfare and prosperity of the "oldest city in the United States."

This body is regularly incorporated under the laws of the Territory. The standing committees for work are: Finance, library, visiting and relief, intelligence, improvement, industrial house, woman's exchange, prevention of cruelty to animals, reception and education, and we soon will have a cemetery committee, as its plans are now nearly perfected whereby it will have charge of Fairview Cemetery in this city.

The public plaza is entirely under the direction of the Woman's Board of Trade of this city, and the city of Santa Fe appropriates \$200 per annum toward its support. A free public library of over 1,000 volumes and a free reading room, furnished with all the leading magazines and papers, are open to the public.

A half or pauper rate is granted this board by both the Atchison, Topeka and Santa Fe and the Denver and Rio Grande Railway companies, and it also owns a pauper burial ground for the benefit of those too poor to purchase lots.

The visiting and relief work is the most important of all its branches, as hundreds are given relief in one way or another every year.

The treasurer's report up to August 4, 1898, shows a balance on hand at that date of \$255.30, total receipts \$234.60, making a total of \$489.90; the expenditures from this amount for salary of librarian, relief work, policeman for plaza, purchase of books, etc., amount to \$142.40, leaving a balance of \$347.50.

The Woman's Board of Trade prides itself on the businesslike way in which its affairs are conducted, as well as its meetings. Its membership remains about the same (30 members) and unlimited. Every progressive woman in Santa Fe should be a member of this board, granted, of course, she be willing and is so situated that most of her time can be given to work for the public.

Officers for the year 1898 are as follows: President, Mrs. Ida Rivenburg; vice presidents, Belle Gable, Emma Day, and E. J. Bishop; recording secretary, Anita Chapman; corresponding secretary, Mary Bishop; federation, Evaline Crichton; treasurer, Celia Hogle; chairman of State correspondence for G. F. W. C., Mrs. M. J. Warner.

MILITARY POST AND GOVERNMENT PROPERTY.

From 1846 to 1894 the Government maintained a large military force at Fort Marcy; but in the latter year the troops were removed and the fort, with its commodious buildings and handsome officers' residences, is practically abandoned. Just why the old post was thus deserted by the Government, no one seems to know. A more central point for the quartering of troops is not to be found in the Southwest, and it certainly seems that it would be better to keep the force considered necessary to maintain order in this district at a central point than to have them scattered about the Territory in isolated forts.

On the north end of the military reservation stands the Federal building, a handsome stone building fitted with all of the modern improvements. In this building are located the offices of the Land Department, the internal revenue office, and the offices of the Court of Private Land Claims, with the clerks, interpreters, translators, and attorneys.

MISCELLANEOUS NOTES.

Santa Fe in many respects is a city of modern ideas and improvements, and a pueblo of the seventeenth century in many others. These glaring contradictions constitute the source of attraction to the many visitors:

A splendid system of waterworks supplies the dwellings and business blocks with water for domestic purposes, and furnishes protection against fire; the streets and buildings are lighted with electricity, and the dwellings erected within the last few years are fitted with the most approved sanitary appliances. However, a walk of only a short distance in any direction from the business part of town will take the sightseer into quarters where the light of the nineteenth century has not yet penetrated.

The newspapers of the city are the Daily New Mexican, the Weekly New Mexican Review, El Nuevo Mexicano, and El Boletín Popular, the two latter being Spanish publications.

EARLY HISTORY.

In 1541, when Coronado passed through the then unexplored country in search of the fabled Seven Cities of Cibola, he found an Indian pueblo or town already established upon the spot where the city of Santa Fe now stands. It was undoubtedly a place of much importance among the tribes who occupied the country at that time, as Coronado estimated the population at 15,000 souls. The many natural advantages of the location early attracted the attention of the Spanish settlers, and about the year 1600, perhaps sooner, it became a permanent Spanish town and the seat of government for that part of New Spain which was ceded to the United States in 1848.

On August 8, 1680, the Pueblo Indians, under the leadership of Popé, a Taos Indian, revolted against the Spanish and began a war of extermination on the invaders. So successful were they in the uprising that on August 21 of the same year the Spaniards were compelled to evacuate the town and retreat to a point near what is now the city of El Paso, Tex. So soon as the Spanish were gone Santa Fe was partially destroyed by fire. The churches and monastery were burned save the adobe walls, the official documents furnished fuel for a huge bonfire in the plaza, and as far as possible all evidences of the Christian religion were wiped out.

Santa Fe, and in fact the whole land, remained in possession of the Indians until September 13, 1692, when Don Diego de Vargas Zapata Lujan, at the head of 80 mounted Spaniards and 100 friendly Indians, after a battle of eleven hours, defeated the Pueblos and regained possession. After that memorable fight the Spanish maintained their supremacy in New Mexico until August 18, 1846, when Colonel Kearny, at the head of a detachment of United States troops, entered Santa Fe and took possession of it in the name of the United States. It is impossible to here go into details of the history of the city before or after the American occupation, interesting as it is, but in the light of that history no other city in the entire country is so rich in tradition and in historic events as this ancient city of the Spaniards.

PLACES OF INTEREST.

To enumerate all the places of interest in Santa Fe would require entirely too much space for the purposes of this brief sketch, but a few of the most important are:

The Territorial library, containing the ancient Spanish and Mexican archives from 1621 to 1846.

San Miguel Church, built in 1540, partially destroyed in the revolution in 1680, reoccupied in 1692, and completely restored in 1710. This is the oldest church in the United States, and contains many relics of the early days.

The Old House, believed to antedate the Spanish occupation.

The cathedral of San Francisco, behind which is the chancel of the old parish church, with a carved and painted reredos, both curious and interesting, erected by Governor Del Valle and his wife in 1761.

The cathedral museum, containing many Spanish paintings and other objects of interest.

The Territorial historical rooms, full of antiquities of historical interest.

Old Fort Marcy, the commanding situation famous in all the sieges of the city; ruins of the old fort built by Colonel Kearny in 1846.

The garita, on the road to old Fort Marcy, by the west wall of which the leaders of the revolution of 1837 were executed.

The plaza, in the center of the town, around which cluster many memories of the conquest of the land by the hardy Spaniards and of the stirring scenes of more recent days. The soldiers' monument is located in the center of this park.

The church of Our Lady of Guadalupe, with its large and interesting altarpiece on canvas, containing six pictures of the appearance of the Virgin to Juan Diego, and other paintings; picture painted by Salcido in 1779 on copper, and many other paintings and wood carvings.

Monument to Kit Carson in front of the Federal building.

The Rosario Chapel, erected on the spot where De Vargas made his vow before the surrender of the city in 1692.

The most interesting of all the old buildings is, without doubt, the governor's palace, an adobe structure, built in 1598, and continuously occupied by the Spanish, Mexican, and American governors for three hundred years. The men who have lived and conducted the affairs of state in the old pile included some of the foremost names of the land, not only of the Territory but of the Eastern States.

To quote from the words of ex-Governor Prince, author of the most authentic and complete history of New Mexico extant:

Without disparaging the importance of any of the cherished historical localities of the East, it may be truthfully said that this ancient palace surpasses in historic

interest and value any other place or object in the United States. It antedates the settlement of Jamestown by nine years, and that of Plymouth by twenty-two, and has stood during the two hundred and ninety-nine years since its erection not as a cold rock or monument, with no claim upon the interest of humanity except the bare fact of its continued existence, but as the living center of everything of historic importance in the Southwest. Through all that long period, whether under Spanish, Pueblo, Mexican, or American control, it has been the seat of power and authority. Whether the ruler was called viceroy, captain-general, political chief, department commander, or governor, and whether he presided over a kingdom, a province, a department, or a Territory, this has been his official residence.

From here Onate started, in 1599, on his adventurous expedition to the eastern plains; here, seven years later, 800 Indians came, from far off Quivirato, to ask aid in their war with the Axtaos; from here, in 1618, Vincente de Salivar set forth to the Moqui country, only to be turned back by rumors of the giants to be encountered; and from here Peñalosa and his brilliant troop started, on the 6th of March, 1662, on their marvelous expedition to the Missouri; in one of the strong rooms the commissary-general of the inquisition was imprisoned a few years later by the same Peñalosa; within its walls, fortified as if for a siege, the bravest of the Spaniards were massed in the revolution of 1680; here, on the 19th day of August of that year, was given the order to execute 47 Pueblo prisoners in the plaza which faces the building; here, but a day later, was the sad war council held which determined on the evacuation of the city; here was the scene of the triumph of the Pueblo chieftains, as they ordered the destruction of the Spanish archives and the church ornaments in one grand conflagration; here De Vargas, on September 14, 1692, after the eleven hours' combat of the preceding day, gave thanks to the Virgin Mary, to whose aid he attributed his triumphant capture of the city; here, more than a century later, on March 3, 1807, Lieutenant Pike was brought before Governor Alencaster as an invader of Spanish soil; here, in 1822, the Mexican standard, with its eagle and cactus, was raised in token that New Mexico was no longer a dependency of Spain; from here, on the 6th day of August, 1837, Governor Perez started to subdue the insurrection in the north, only to return two days later, and to meet his death on the 9th near Agua Fria; here, on the succeeding day, José Gonzales, a Pueblo Indian of Taos, was installed as governor of New Mexico, soon after to be executed by order of Armijo; here, in the principal reception room, on August 12, 1846, Captain Cooke, the American envoy, was received by Governor Armijo, and sent back with a message of defiance; and here, five days later, General Kearny took formal possession of the city, and slept, after his long weary march, on the carpeted earthen floor of the palace.

Coming down to more modern times, it may be added that here General Lew Wallace wrote *Ben-Hur*, while governor of the Territory in 1879 and 1880.

CAPITOL BUILDING.

A few years ago the beautiful capitol building, located in the south part of the city, was burned, and the Commonwealth has had no official structure except the old palace; but at the present time a new capitol, which will compare favorably with the state houses in most of the States, is in course of construction, and will be ready for occupancy by the time the legislature convenes again.

A LOOK INTO THE FUTURE.

What the future may have in store for the city of Santa Fe only that future will reveal, but it is certainly something bright.

With the unrivaled climate, the fertility of the soil in the immediate vicinity, the orchards that are rapidly multiplying, and a constantly growing population, the outlook is anything but discouraging. The business depression that has held back enterprise and development for the past four or five years has given place to an era of prosperity, which is sweeping over the entire Territory. Mining operations are assuming unusual activity, cattlemen are reaping a harvest, and the experiments that have been made in sugar-beet culture are rapidly crystallizing into action looking to the establishment of a large factory here in the near future, and it is certainly within reason to predict a marvelous growth for the city of Santa Fe during the next five years.

SAN MIGUEL COUNTY.

SIR: In compliance with your request, I give you herewith a somewhat condensed report of San Miguel County:

Our county has an area of nearly 3,500,000 acres, of which it is estimated that about 2,500,000 acres are adapted for grazing and agricultural purposes. The Canadian and Pecos rivers have their principal sources of supply in this county and constitute its drainage channels, and as stated in one of the recent reports of the New Mexico bureau of immigration, much land could be placed under irrigation by the construction of water-storage reservoirs, owing to the county being so well watered by the streams just mentioned and the Gallinas, Sapello, and Tecoleté rivers and their tributaries.

The western portion of the county is mountainous, rising from the plains to some of the highest ranges in the Territory, and capped with snow a good portion of each year, which constantly feeds the mountain streams with pure water that passes off into and through the valleys below.

In addition to the many never-failing streams is coupled the fact that our rainfall in this section of the Territory is unusually good; in truth, so good at certain seasons that one is reminded of the weather of the more eastern States.

Our valleys are well adapted for farming and gardening, the soil being fertile and of a good depth.

I am informed by a practical gardener near Las Vegas that the average crop of wheat is between 25 and 30 bushels to the acre, and of oats about 40 bushels per acre.

All kinds of vegetables do exceedingly well and in many instances have a better flavor, owing to our sunshine, than the garden truck of the east.

From all sections of the county I am informed that the crops are in magnificent condition, more especially so in the region of the Sapello and Pecos rivers, the harvest far exceeding that of several years past, and our farmers are simply jubilant over the prospect of a plentiful and fine harvest of all kinds of cereals.

Although fruits are not raised to a very considerable extent in this county, it is well known that orchards along the Pecos River valley, from San Jose down, are in good condition and loaded with fruit, such as apples, pears, and peaches; the crop of the latter is reported as being very good and equally so below the mesas at Canyon Largo and the immediate vicinity.

The crying need of our county to-day is the settlement of the title to the Las Vegas grant, which covers about one-sixth of the county's area (and that, too, immediately surrounding the city of Las Vegas), and a proper encouragement to capital for the building of water-storage reservoirs, which could be given if the grant title were settled.

Our population I would estimate at about 35,000 inhabitants, which might easily be doubled if we were prepared to take advantage, in all respects, of the conditions that nature has given us.

As regards mining in San Miguel County there is nothing new to be said. The Rocky Mountain range which runs across the western end of the county contains a variety of minerals, but whether in paying quantities remains for future prospecting to determine. Plenty of good indications for gold, silver, copper, iron, lead, and coal have been discovered, and it is not at all improbable that with the intelligent expenditure of capital paying mines would result, but nothing has intervened since last year's report that will even justify this county in "reporting progress" from a mining standpoint.

The cattle ranges in San Miguel County have never been in finer condition than at present, but owing to the fact that the southeastern portion of our county was taken from us a few years ago to form Guadalupe County, and the eastern end to make up part of Union County, has naturally resulted in cutting down the number of cattle within our borders, although Las Vegas, our county seat, is growing in importance each year as the cattlemen's headquarters for this part of the Territory, including the counties of Mora, Union, and Guadalupe, and is the point for cattle buyers to visit in their search for owners of desirable herds.

San Miguel County is exceedingly rich in flocks, and a recognized center of the sheep-breeding and woolgrowing industry of New Mexico. In this county, as elsewhere in the Territory, the sheep business is pursued by men who are abundantly provided with the qualities which always command success—intelligence, perseverance, and energy—and to-day they are prosperous, their flocks are increasing in numbers, they have improved the quality and quantity of the wool on the sheeps' backs by judicious and intelligent breeding, and the excellent and delicately flavored mutton from their sheep has created a demand for them that they can only inadequately supply.

The sheepmen of San Miguel County are also fortunate in being in close proximity to an excellent wool market.

To-day, as for many years past, Las Vegas, the county seat of San Miguel County, is acknowledged to be the best wool market to be found anywhere in the Southwest. The location of three large wool-scouring establishments at Las Vegas has been the principal factor in making the city such a desirable market for the woolgrowers. These plants alone are capable of handling between 7,000,000 and 8,000,000 pounds of grease wool per annum, and their presence and eagerness to secure wool creates an unsurpassed home market, and engenders a competition for the clips shipped here of the keenest and healthiest description, with the result that the growers can obtain more money for their wool here than they can anywhere else.

In the past twelve months the scouring mills at Las Vegas consumed about one-third of the wool clip of New Mexico, and over half of it was handled by the Las Vegas houses.

From the most remote sections of the Territory wool is transported overland and by rail to Las Vegas, attracted by the excellent market, the growers admitting that it pays them to ship to Las Vegas rather than to dispose of their clips at markets nearer home.

In addition to the help derived from the scouring mills, the woolgrowers who do business at this point are also benefited from another source. Here are located immense wholesale and commission houses, who furnish the sheepmen with provisions and other supplies necessary to their business, and who are in the closest touch with the sheep and wool markets of the East at all times, and thoroughly informed in regard to the values of both sheep and wool.

To these houses the growers consign their clips to be sold, and as their interests and those of the sheepmen are mutual, their knowledge of present and prospective conditions enables them to handle the clips to the very best advantage, and to obtain for their customers the highest market prices, which alone they would hardly have been able to secure.

At this point, also, are located resident sheep buyers, who are in the market the year round for sheep, as the scouring mills are for wool. During the summer and fall months, Las Vegas is visited by large numbers of outside buyers and feeders anxious to secure New Mexico sheep for their feeding pens.

Further reference to the advantages gained and benefits derived from scouring mills, as well as descriptions of the classes of sheep bred and wool grown in New Mexico, will, no doubt, be found in the general article on the sheep and wool industry, as I know you consider this subject of such great importance as to justify a prominent place in your report.

There are two establishments in Las Vegas erected for wool-pulling and tanning purposes. The process is an elaborate one, consisting in the treatment of the wool pelts in such a manner as permits the removal of the wool from the pelt, after which the skin, or slat, as it is technically called, is tanned into leather. The skins from New Mexican sheep are well and favorably known in leather circles, Eastern tanners claiming that the leather made from these skins is superior to that produced from any other class of sheep pelts. The establishment of pulling and tanning plants here has given an impetus to the trade in sheepskins, as it provides the longed for desideratum of all producers (let their products belong to the animal, vegetable, or mineral kingdom), a never-ceasing, excellent home market.

Las Vegas is one of the principal cities of the Territory, having a population of about 10,000 inhabitants, and is well and favorably known for its wealth and enterprise, which was practically demonstrated only last month by our citizens raising in a few days over \$16,000 for the completion and furnishing of the New Mexico normal school located at Las Vegas.

Of course, it is expected that the Territory will refund this money to our citizens, but by this prompt action the board of regents is enabled to open the school this fall.

This is of great importance to Las Vegas, as arrangements have been made by which the Las Vegas public schools will, as far as practicable, be run in close harmony with the normal—the public high school occupying part of the normal school building—and the grade of our public school system, generally, raised higher than ever before. But no doubt the board of regents of the normal school will touch upon this matter more in detail in their report to you.

The division headquarters of the Atchison, Topeka and Santa Fe Railroad are located at Las Vegas with a monthly pay roll of \$30,000. The railroad company is just completing a very fine hotel to be run by Mr. Fred Harvey, so well and favorably known to all the traveling public. This will give Las Vegas one of the finest hotels in the Southwest.

The Las Vegas Hot Springs, 6 miles distant and connected by a branch line of the Santa Fe, is, no doubt, a subject of special mention in your report. The springs themselves are among the most famous on the Western Continent for delightfulness of situation, medicinal qualities, and beautiful surroundings.

The Montezuma Hotel, located at the springs, and also the property of the Santa Fe Railroad, is one of the finest hotels of its class in the United States.

The mercantile business at Las Vegas is large and profitable in both the wholesale and retail branches.

We have four large wholesale and commission houses that do an annual business ranging from \$500,000 to \$700,000, besides having a number of smaller houses doing an annual business of from \$100,000 down to the small retail dealer. We have three banks, two nationals and one savings, all doing a profitable business, with deposits aggregating \$1,000,000, besides a prosperous building and loan association that has done much to aid in the upbuilding of our city. In fact Las Vegas is well supplied with all the conveniences that naturally belong to any American city of our size, except that we continue to run our street cars by mule power instead of electricity, but hope to report a change in this respect within a short time.

The climate of New Mexico will, I know, receive especial mention under its proper heading in your report, but as the northern half of the Territory differs in some respects from the southern half as regards climate, I desire, in conclusion, to say a few words on this subject, more from a local standpoint, from data very kindly furnished me by Dr. F. H. Atkins.

Although the climate of New Mexico is justly famed for its health-giving qualities, the residents of San Miguel County are not to be blamed if they feel, as the result of long experience, that their much-favored county has the cream of all the Territory has to offer. High in its western part, naturally, it has occasionally pretty cold winters, but the colder they are the better the health. In its eastern portion it has greater winter warmth from lower altitude, a condition demanded by many visiting invalids. The climate, high or low, is dry, the rainfall at Las Vegas averaging about 18 inches a year.

The summers in the regions above 5,000 feet are not to be surpassed in America; warm only in the afternoon, and then only 80° to 85° for two or three hours; at night the temperature requires a blanket to sleep under, and even in the daytime the change from the clear, dry sunshine to the shade gives remarkable coolness. Malaria is unknown, as also are those other pests of tourists in the Southwest, fleas and mosquitoes. So, also, violent storms are not familiar in this favored section. The winter precipitation—all as snow—is scarcely more than 1 inch for the three months. The spring and summer dryness are represented by a relative humidity, often as low as .20, the figure for the year being about .45.

At Las Vegas about three hundred and forty days each year are sunny and the greatest cloudiness occurs in midsummer during our rainy season when it can be most easily tolerated.

Very respectfully,

JOHN W. ZOLLARS.

Hon. MIGUEL A. OTERO,
Governor of New Mexico, Santa Fe, N. Mex.

SAN JUAN COUNTY.

AZTEC, August 13, 1898.

YOUR EXCELLENCY: I inclose a short statement of the principal points of progress made by our county during the last year. I have been delayed and hampered by sickness so that I am afraid that it will not be of much benefit to you—but under the circumstances I have done as well as I could. If I can be of use in any way, always instruct and command me.

Very truly, yours,

J. G. KELLO.

The county of San Juan has made large progress in the development of all its various resources during 1897-98.

All crops were large during 1897, but the fruit crop was phenomenally so, fruit trees of all kinds being loaded to the breaking point.

The apple crop was not only large in quantity, but great in quality, size, and perfection of color. One wholesale firm of Chicago alone bought 8,000 boxes of select fruit, which was sold at fancy prices. During the winter one train of 25 cars containing 500,000 pounds of the choicest kinds was shipped from Durango, Colo., east and found immediate sale at the highest prices. One firm of that place alone shipped of San Juan County apples 1,500,000 pounds to Eastern markets.

The shipping records of Durango merchants show that 5,000,000 pounds of apples were shipped by San Juan County farmers into Durango, Colo. This does not include the large amount that was peddled in and about the neighboring mining towns. Besides all this a very large amount of fruit was shipped and sold from Gallup, N. Mex.

It has been estimated that the apple crop of the county would aggregate from 8,000,000 to 10,000,000 pounds. The peach crop was fully as large, but owing to its perishable nature and the lack of near railroad facilities, much of this crop went to waste. Apricots, pears, plums, and prunes were also marketed in large quantities.

There was also a large increase in the acreage of alfalfa, corn, and wheat, and the product of these was full or above the average. With a surplus of alfalfa and grain our farmers are giving more attention to the feeding of stock cattle and hogs to consume these products instead of hauling them off to distant markets.

The crying need of San Juan County is a railroad south connecting with the Santa Fe system. We are practically now a part of Colorado, as there are our nearest markets.

These average from 35 to 50 miles away, and the farmer puts in nearly half of his time marketing his produce. This leaves him little time for improvements. Yet in spite of all this we doubt if any part of New Mexico has made more improvements than this county during the past year in proportion to their means.

A large bridge has been built at Aztec over the Animas River, and there is now in progress of completion a flouring mill at the same place. The town of Farmington has made good progress in increase of population and has built many good residence structures.

The Fruitland, La Plata, Bloomfield, and Largo districts show improvements in farm buildings and residences which show prosperity and thrift. There has been a slow though steady increase of immigration into this county in the last ten years. This, however, bids fair to be largely increased in the coming year, as a large part of the best farming lands lying on both sides of the Animas River are to be brought under irrigation by large canals projected and begun by the Animas River Land and Irrigation Company. These canals will cover from 80,000 to 100,000 acres of land, all of which is the best in the county for richness and depth of soil, exemption from early and late frosts, and freedom from excess of alkali.

They are ideal lands for fruit and alfalfa culture, and only the expense of constructing ditches on them has kept the original settlers from selecting them in preference to the lower lands. Now, with improved machinery, and capital to construct canals at a comparative low cost, these lands will come under cultivation immediately, as little or no clearing is necessary, but large tracts can be plowed as easily as improved land. The supply of water is inexhaustible and can be furnished at a very low cost.

Already settlers from the east are coming in, and there are abundant reasons to believe that the population of San Juan County will be largely increased within the year.

There has been a marked stimulation of the sheep industry in the last year. Herds have been largely increased and a better class of stock introduced.

We have large bodies of land which are fit for no other purpose than grazing sheep, so that these have been practically waste lands during the years of Democratic prices of wool. Now they are utilized, and add largely to the prosperity and income of the county.

Taken as a whole, the prospects of San Juan County have never been so good for a future of extended progressive prosperity.

Respectfully,

J. G. KELLO.

MIGUEL A. OTERO,

Governor of New Mexico, Santa Fe, N. Mex.

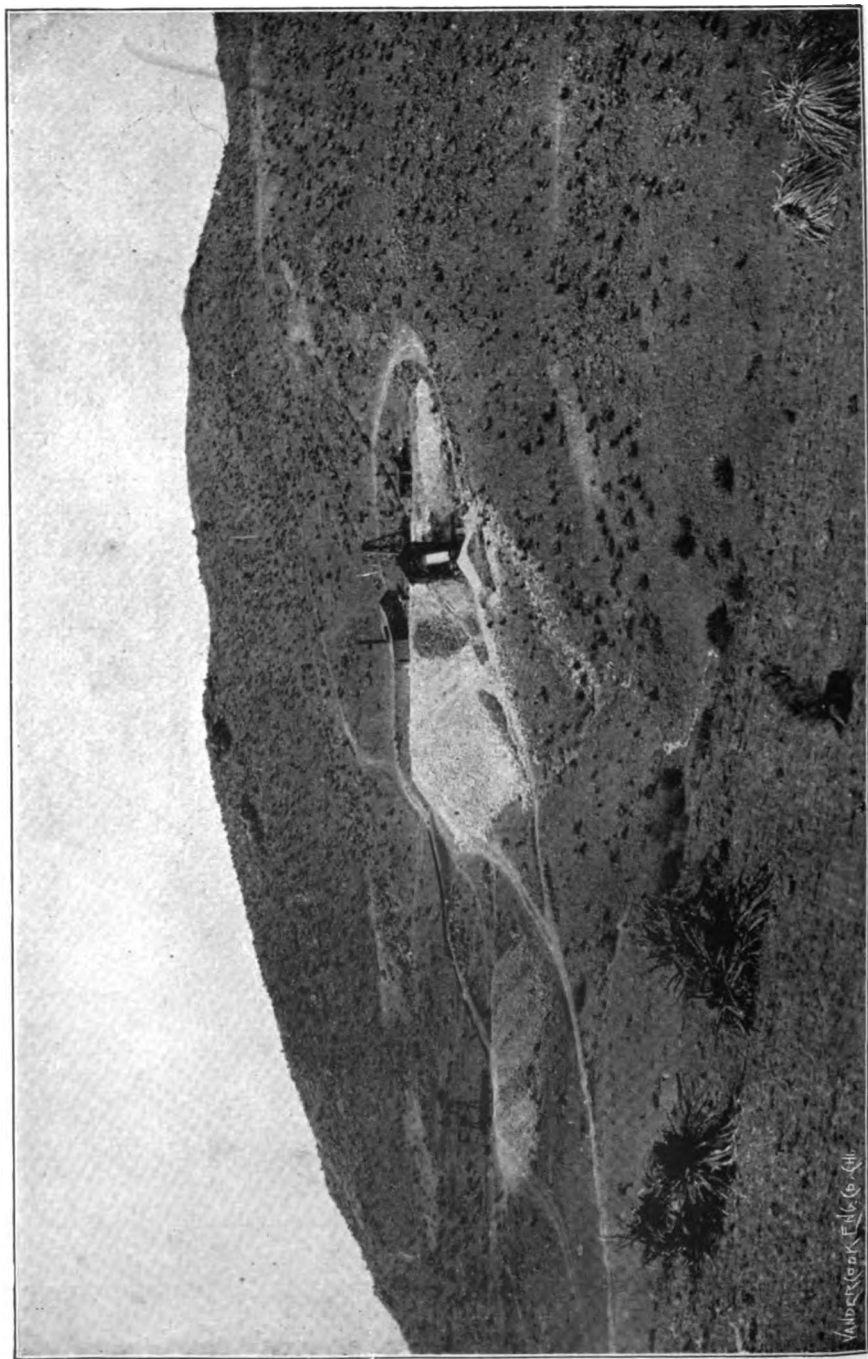
SIERRA COUNTY.

Sierra County is situated in the south central part of the Territory of New Mexico, and has a population of between 6,000 and 7,000. The area of the county is about 2,376 square miles. It lies principally in the Rio Grande watershed, which river traverses its entire length, taking up in its course hundreds of smaller streams and bodies of water, which will serve as an important factor in making agriculture and horticulture the leading industries of this section.

AGRICULTURE.

There are about 5,000 acres in the county of Sierra under cultivation, but it is estimated that over 50,000 acres would bear crops if there were farmers to plant them. The water facilities are of the finest.

Colonies of from ten to twenty families, with small capital, say from \$1,000 to \$2,000 each, could make excellent locations in this county. The land is cheap and the titles are good, and there is a demand at all times for agricultural products.



GOLD MINE, SIERRA COUNTY.

Valley View, California

MINING.

Among the mining districts of our Territory the Hillsboro district, near Hillsboro, in the county of Sierra, should be especially mentioned from their past and present yield of gold, and by reason of those features of recent discovery and development which promise enlarged operation and production.

The annual output of gold, silver, and copper obtained from quartz veins and from placers has been something over \$350,000 for the past few years, or since the mines have begun to be worked at all scientifically and systematically. Of this yield but a small portion has been taken from the placers, yet the greatest promise of the district lies in these extensive gold fields, and their output was very large for some time after their discovery in 1877. The process of working them was to haul the gravel some 4 or 5 miles to the Percha River, but only the rich gulches and pockets would justify such expense, and now the water must be brought to the ore. Quite recently California experts, after an exhaustive examination of placers, have recommended to their principals an investment of \$600,000 in reservoirs and hydraulic work with confident promise of large profits. The ground is easily shown to contain gold in paying quantities.

There are no vexatious laws to hinder placer mining in this Territory, and in any event these placers do not converge upon any agricultural lands. With certain payment in gold of all revenues and profits, it is not likely that these fields will much longer be unworked for want of the capital necessary to raise the water from the stream beds.

The Tripp mine has lately developed a very large and high-grade body of gold ore, and present indications point to it as being the largest find so far in this district. This mine is being worked by Hon. William H. Andrews, of Pennsylvania, and good results will no doubt follow.

The Wicks mine has sunk its shaft from the 200 to the 300 foot level, and has developed a fine body of ore the entire 100 feet, larger and richer than anything above the 200 foot level.

In addition to these two mines, there are many others that have been showing an increased development and production, and the balance of the mines are producing their usual production, and are shipping their regular amounts, which serve to employ many men outside of the prospectors.

CATTLE INTERESTS.

The cattle interests have never been brighter or better, and the grass on account of the abundant rainfall is fine; the cattle men are fast retrieving their lost fortunes, and the herds are increasing with wonderful rapidity.

SOCORRO COUNTY.

The following report was furnished by Mr. W. E. Martin:

Socorro County occupies the central latitudinal portion of New Mexico, and extends westward from Lincoln County to the Arizona line, a distance of 230 miles. It is the largest county in the Territory, and is peculiarly fortunate in the wealth and diversity of its resources. The valley of the Rio Grande extends through its center, and its surpassing fertility is attested by the numerous thriving settlements embraced within its boundaries.

Of these towns the city of Socorro, the county seat, is the largest. Situated at the foot of the Socorro Mountains on land gently sloping toward the river, sheltered from the northwest and southwest winds, with an elevation of 4,665 feet, it has justly

earned its reputation as an ideal health resort. Its water system is perfect, and conducts the water, famous for its softness and purity, from the inexhaustible spring at the foot of the mountain to all parts of the city. In 1892 the Court of Private Land Claims granted to the city of Socorro 4 square Spanish leagues of land, centered by the Roman Catholic Church of Socorro, thus assuring perfect title to those acquiring lands within its limits. Without possessing a single individual who might nowadays be termed rich, yet for substantial, well-to-do citizenship Socorro can vie with any city of her size in the Union. Her enterprises are controlled by men of standing and public spirit. Blessed with a generous, hospitable, and elevated society, she stands ready to respond to every progressive step that shall tend to develop the but yet half-awakened resources of the county. With a population of some 5,000, Socorro is past the stage of growth when it is possible to embody in a short report a reference to each of its many enterprises. With her smelters, fire-clay works, natatorium, large mercantile establishments, mills, etc., she has certainly taken material strides toward becoming a large and prosperous city. Of her three flouring mills, the steam mill of John Greenwald & Co. has recently been enlarged and improved, and is turning out flour from the peerless Socorro County wheat, which is equal to the finest products of Eastern mills. Among her recent improvements the splendid distillery of Abe Coon, the great orchardist, deserves mention. This structure is built of brick, and is furnished with the most modern appliances for the manufacture of distilled liquors. Though in operation only a few months the product which Mr. Coon is turning out has achieved a gratifying reputation.

Two large public schools, a Catholic seminary, and that magnificent structure, the celebrated school of mines, which opened this year with a greatly increased attendance, give evidence of the fact that Socorro is not behind in educational advantages.

The happy situation of Socorro from a sanitary standpoint has long been recognized by the medical faculty. Its benefits have been so pronounced that a project is now on foot to establish a large sanitarium above and about 2 miles distant from the town, on land deeded to it by the city.

San Marcial, a thriving railroad town, is the next largest in the county. Magdalena, on the Magdalena branch of the Santa Fe Railroad, is a busy mining town, and the largest stock shipping point in the Territory.

MINING.

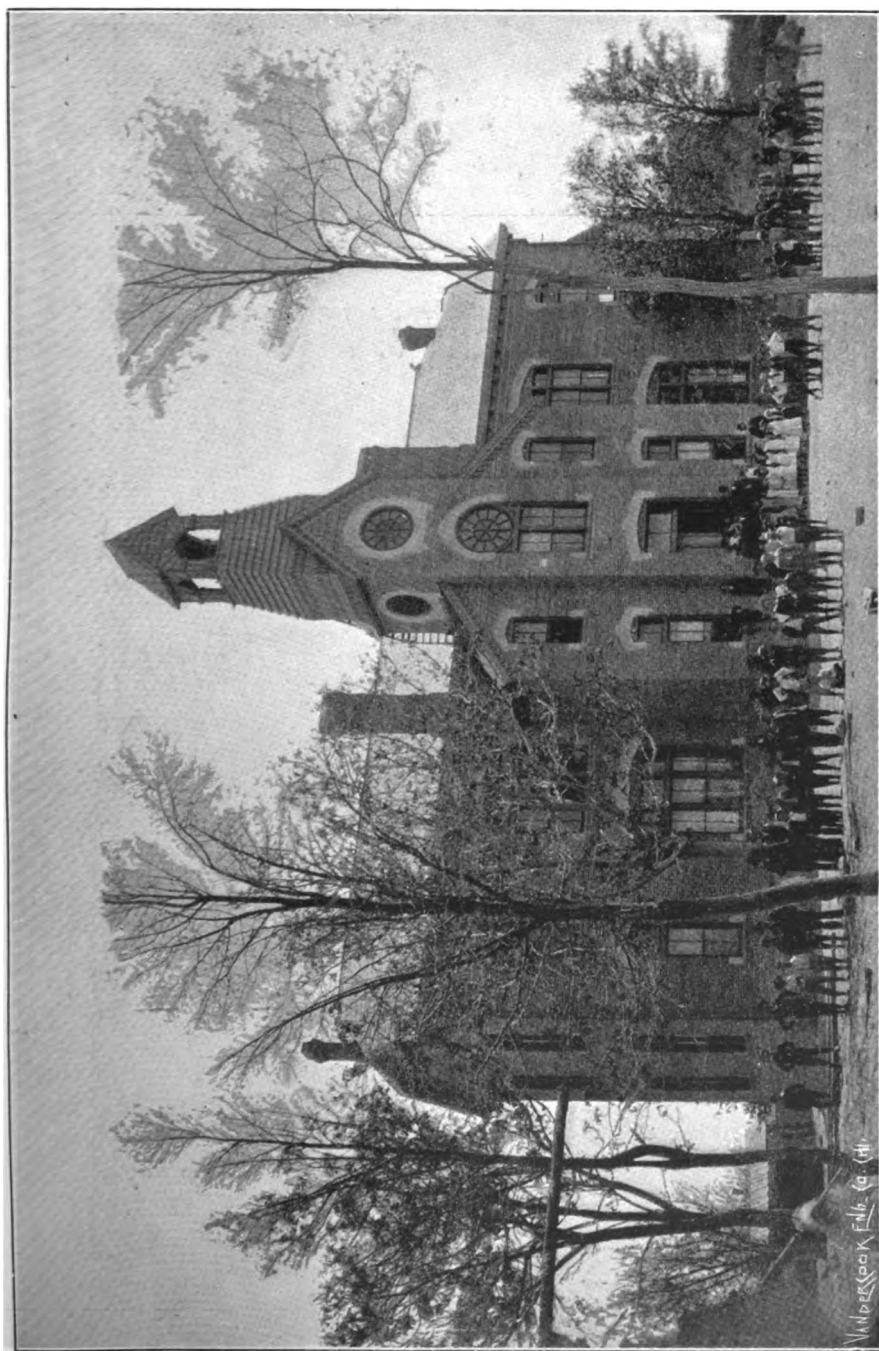
Socorro County's mining resources are being rapidly and widely developed. At Water Canyon, 16 miles west of Socorro, the Timber Peak Mining Company, a Philadelphia corporation, have just completed a road some 7 miles long at a cost of nearly \$8,000. This leads to their mines on Timber Peak, where they have opened up an immense body of ore for the operation of a modern reduction plant of 150 tons capacity. The mill is in process of erection and will be running this fall. The mines in Water Canyon, Six Mile Canyon, and in the Socorro Mountains are all within 3 to 20 miles of the magnificent smelting plant at Socorro, and the haul to the smelter being down grade, makes it possible to operate mines in those sections containing low-grade ores with success. At Graham, in the western part of the county, the Helen Mining Company is operating, by water power, one of the best-paying mills in the Territory. The utilization of this power cost over \$25,000, and its capacity can be judged from the fact that the company are now constructing a bucket tramway from their mines to the mill, and have recently purchased an electric plant which will furnish sufficient power to run all of the mills in the Mogollon mining district.

At Magdalena the graphio smelter, erected about three years ago, has been running successfully on ores from its own and other mines in the Magdalena mining district with but one shut down since its construction. Without going into statistics, it is sufficient to say, as indicating the development of the mining industry in Socorro County, that six mining companies have been incorporated within the past year for the purpose of operating in this county. These companies are controlled by men of capital and experience, and all of them have begun the immediate and extensive development of their properties.

The many perpetual streams flowing through the mineral belts of the county, and the abundance of timber, with the equable winter climate, make it possible to work the mines throughout the entire season at a minimum outlay.

Besides the precious metals, there are many valuable lead and copper properties. Just recently large quantities of lead and copper were discovered a short distance east of Socorro, which are receiving the attention of capitalists.

The Carthage coal mines, 10 miles east of San Antonio, are being steadily operated by A. H. Hilton, of San Antonio. Coal of the best quality is found throughout the county. The smelter at Magdalena is fired with coal mined in that vicinity, and it needs only additional railroad extension to open up valuable coal fields in the county.



PUBLIC SCHOOL, SOCORRO.

AGRICULTURE.

The valley of the Rio Grande, from its source to its mouth, is as rich as the valley of the Nile, and all the products which are raised in the most favored sections of the country are here raised in the greatest abundance, and are of the finest quality. At every State and international exposition the grain, fruits, vegetables, and grasses of the Rio Grande have competed with and excelled the finest products of our most favored agricultural States.

In the western part of the county the Frisco, Tularoso, and Gila rivers, with their numerous branches, irrigate valleys of equal fertility to the Rio Grande. Being in a higher altitude, they are of course better adapted to the raising of apples, potatoes, and the hardier products. Their amazing prolificacy can best be realized when it is remembered that their soil is the accumulation for numberless ages of the wash from the mountains, and it is not unusual to go to a depth of 15 or 20 feet before a substratum is reached.

As in other parts of the Territory, and the whole irrigable West, vast areas of land in the county are lying untilled for want of an adequate system of irrigation, especially in the Rio Grande Valley. This land only awaits the introduction of storage reservoirs to repay a hundredfold the outlay therefor.

PREHISTORIC RUINS.

To the archaeologist and the savant the valleys of the Frisco and Tularoso present features of the deepest interest. It is here that the remains of the Pueblos of the historyless races who cultivated the valleys in ages past are found. To the health seeker, for whom the rod and gun have no attractions, the delving among the stone ruins for the artistically painted and skillfully made pottery, for shell and turquoise ornaments, and the curious implements of war, agriculture, and the chase of a people who were certainly not strangers to the arts of civilization, affords a healthful and diverting occupation of intense interest to the speculative mind.

STOCK.

During the past year 8,000 cars of cattle have been shipped from Magdalena. Owing to the high price of beef, many of the principal stockmen have entirely cleaned up their ranges of beef cattle, so that the splendid grazing grounds will not be overburdened for several seasons to come. For the past ten years the stockmen have bred to Shorthorn and Hereford bulls, and there is very little, if any, low-grade stock in the county.

Probably no industry in the county has met with such impetus during the past year as that of sheep raising. Many individuals have gone extensively into the business, and several large corporations have been formed, the largest of which is that managed by the well-known stockman, Montague Stevens, who is associated with General Miles and others in the western part of the county.

All of the principal sheep herds of the county have been bred to high-grade Merino bucks, largely imported from Europe.

Nearly all of the small ranch owners living in the mountainous sections of the county are engaging with profit in the business of raising goats. There is no market less subject to fluctuation than the market for mohair, and with the certainty of good prices and the excellent adaptation of a large portion of the county to the raising of the finest breeds of Angora goats, it is one of the most desirable enterprises for the man of small means to engage in.

WESTERN SOCORRO COUNTY.

Western Socorro County comprises a stretch of territory several times the size of the State of Rhode Island, that will, when it is settled and thoroughly developed, become one of the richest portions of New Mexico.

First is all that rich mining country in the Mogollon Mountains, which, though yet practically undeveloped, except in a few instances, is now the greatest gold camp in the Territory. And there are many other parts of western Socorro County yet unprospected which will without doubt some time in the near future prove rich in mineral.

Then there are numerous streams, in the most fertile valleys, where the most prolific agricultural crops and fruit can be raised. Besides all this, there are immense ranges for cattle and sheep, always covered with

the finest grass, which would be a source of wealth in itself if there were nothing else.

Hitherto the valleys and mesas have been occupied by the big cattle companies, who practically held the entire country with the exception of a comparatively few small ranchmen along the streams. But the conditions have now entirely changed. The big cattle companies have nearly all gone out of existence, and their places are being taken by ranchmen who cultivate small farms, raise their own produce, and also raise small bunches of cattle. At one time the ranges were overstocked with cattle by the big companies, running at large until there was a lack of feed for all; but now there is plenty of grass, and more, too, for all the stock in the country. Besides, it has been demonstrated to the small ranchmen that having 100 cattle which can be kept practically under the owner's eye, is a source of much more profit than 500 running on a larger range.

As to crops and fruits, the small ranchmen who have lived there for years have been able to raise an immense yield of farm products to the acre, and those who have given it a thorough trial have found that all kinds of fruit do remarkably well. In fact, such fruit as apples, plums, cherries, and kindred fruits do much better than on some other lands noted for their fine fruits.

All it needs in this great but thinly settled region is more settlers, a little thrift and enterprise, and markets for their crops, to make this region one of the most prosperous to be found anywhere, and the development and working of the known valuable mines would settle the market question.

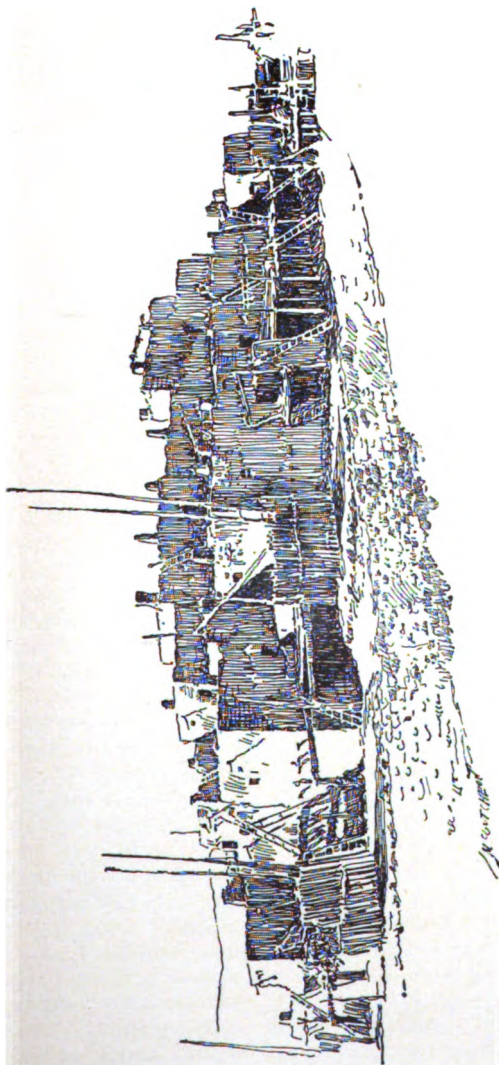
TAOS COUNTY.

The valley of Taos, the county seat of Taos County, is the center, approximately 18 by 30 miles in extent, and has a population of about 7,000, the total population of the county being about 11,000. There are numerous valleys within the county limits, the largest being about 10 by 12 miles in extent.

The wealth of the choicest agricultural and mineral lands and the unlimited supply of water are phenomenal. But few localities in the United States afford the combination to be found here of a rich, productive farming country surrounding an immediate home market for its products. The price of land, however, is very cheap. Tracts of A No. 1 land, varying in extent from 20 to 200 acres, now under cultivation, and with a perpetual water right, can be bought for from \$10 to \$20 per acre, and lands suitable for colonization, with a river frontage, in tracts from 500 to 1,500 acres, for \$5 per acre. Water for the irrigation of these lands is very easy of development and wood is abundant.

The Taos Valley is most picturesque. On the east it is surrounded by mountains in the shape of a half-moon, with no foothills extending out into the mesas to break the view or diminish their grandeur. Several very deep canyons penetrate these mountains for a distance of from 20 to 25 miles, and pour their floods out on the valley lands, where they may be easily used for irrigation.

Eleven streams issue into and cross this valley in a westerly direction, draining a great area of high mountains. When these streams reach the valleys the volume of some of them is as much as 400 or 500 cubic feet. Taking the whole course of the Rio Grande Valley, this section is usually known as the Taos Valley, and it is estimated that there are about 180,000 acres of land subject to the influence of irrigation.



INDIAN PUEBLO VILLAGE AT TAOS.

There are now from 25,000 to 30,000 acres irrigated and cultivated in the valley, and its population is only about 10,000 people. At the very lowest estimate this same land would support fully 20,000 people, and with close and intensive cultivation these figures could be increased to 50,000, which would allow a 10-acre fruit farm to each family of five persons. This area to the Eastern man seems very small, but when it is considered that one small orchard of 5 acres near Taos produced over \$400 an acre, 10 acres, therefore, intensively cultivated, would give a gross income of \$4,000. How many farmers of the East realize such a sum from 160 acres of diversified crops? Of course it must be understood that this money return per acre is from trees in full bearing; but it is by no means excessive or a prize yield; it is simply what can be done with average good culture.

Speaking of the productiveness of the soil of Taos County, one of the earliest explorers says: "The harvest for one year is sufficient for seven. When they begin to sow, the fields are covered with corn that has not been gathered." Taking corn, the crop mentioned, the yield will be well up in the neighborhood of 80 bushels per acre, and other crops will be in proportion.

All fruits and grains of the temperate zone flourish here to perfection, while root crops, such as potatoes, beets, turnips, parsnips, onions, etc., reach a high standard of excellence. Alfalfa is an important product and ranges from 4 to 5 tons per acre, bringing at market from \$12 to \$14 per ton. This is a good section for fruit. Apples, peaches, plums, and pears grow to perfection and find a ready market at profitable prices.

This county of Taos is commonly called "The Garden of Eden," and, being so well supplied with water for irrigation, is an attractive country for the promotion of colonization enterprises. Many inquiries are of late being made for tracts of land that are desirable for colonization purposes, and no part of the Southwest can be more safely recommended to colonists than the rich, well-watered valleys of Taos County and northern New Mexico.

So much has been said about the necessities of irrigation and of the advantages of farming by irrigation in New Mexico that the reader might very properly conclude that in no portion of the Territory can agricultural pursuits be carried on without irrigation.

It would be unfair to certain localities to fail to state that in the higher mountain valleys and high mesas or table-lands crops grow successfully without irrigation.

Especially has this been proved to be so in the northeastern part of Colfax County. Here wheat, oats, barley, hay, potatoes, and fruits grow without irrigation. Johnson mesa, east of Raton, which until a few years ago was used only as grazing land for sheep and cattle, is now settled up by several hundred prosperous farmers. Information comes from the land office for this district, situated at Clayton, Union County, N. Mex., that filings under the United States land laws in that office by settlers on these higher table-lands, as well as on irrigable lands, are rapidly increasing in number.

UNION COUNTY.

Union County, the northern county of the Territory, touching Texas on the south, Oklahoma on the east, and Colorado on the north, was created in 1893 by an act of the New Mexico legislature, and is a part of three older counties, Colfax, Mora, and San Miguel. Its area is in

acres 4,126,000, mostly grazing land, abundantly watered by springs and well-supplied streams, and broken frequently by canyons in the northern and southern parts.

The population of Union County is between 5,000 and 7,000, almost without an exception prosperous and enterprising. Never in the history of the county has there been an appeal for assistance because of poverty by the inhabitants, nor is there a pauper within the confines of the county.

The industries are cattle and sheep raising, both of which have for two years past proven wonderfully remunerative; with summers free from hail and severe inclemency, and winters during which heavy snows and blizzards known to northern range, are noticeably absent. Irrigation, which has blessed her sister domains in the south, is not as yet to any great extent practiced in Union County, although on the Cimarron River, a stream rising near the town of Folsom and flowing south near the northern and eastern lines of the county, are many fine farms stretching along both sides of the river for a distance of 50 or 60 miles to the Oklahoma line, raising alfalfa and garden produce.

The altitude of 5,230 feet is especially recommended for all bronchial and pulmonary affections, asthma, etc., which diseases are entirely unknown to the natives of this section of the West. A physician of twenty years' residence in this portion of the Territory made the astounding statement not long ago before a medical meeting in the East that "he had never known a fatal case of pulmonary trouble among people born in this section; and that visitors suffering from consumption, excepting those in the last stages, received immediate help from the climate." Statistics show that Union County enjoys over three hundred days of sunshine yearly, and that fogs and dampness are unknown.

The taxable property of the county is \$2,000,000; the debt, including the court-house bonds, is less than \$40,000, and the rate of taxation low.

The principal town of Union County is Clayton, situate on the Union Pacific, Denver and Gulf Railroad, 126 miles from Trinidad, Colo., 342 miles from Denver, and 11 miles from the Texas line on the south. This place, rising from a primitive cattle-shipping point in 1889, which on more than one occasion the "festive cowboy," then "lord of the plains," "took in," has matured into a well-built village of 800 inhabitants, with stone buildings and modern improvements, water system, and electric lights. It has also a \$10,000 brick schoolhouse recently built, a \$20,000 court-house and jail, and a new hotel costing \$15,000.

The amount of business transacted—supplies for the ranches as far away as the Canadian River on the south, 100 miles to Oklahoma points on the north and east, sold by the wholesale and retail stores—aggregates nearly \$500,000 annually. From Clayton is shipped each year 1,500,000 pounds of wool, which is marketed in July and August, from 100,000 lambs and 50,000 sheep.

Clayton is the site of the United States land office, within the jurisdiction of which are 7,000,000 acres of Government land open for settlement and sale under the land laws of the United States, with a total settlement in 1897 of 72,010 acres.

Neat residences well kept impress the visitor at once with the prosperity of the place.

The next largest town in the county is Folsom, which town is also situated on the railroad, 56 miles north of the county seat, Clayton; prettily located, nestling in the foothills near the base of Mount Couplin, an extinct volcano, and at the head waters of the Cimarron

River. Canyons and beautiful drives are on every hand, and green alfalfa fields, from which are cut, baled, and shipped many tons of feed each year.

Folsom has three wholesale stores besides several smaller ones and two most excellent hotels. The place is a favorite summer resort for people from Texas, its even temperature and cool nights together with the beauty of its scenery tempting the traveler from the warm districts of the South. Its population is 900. It has been justly called "the Bijon of the Mountains" from its unique location.

SHEEP.

Union County with its broad expanses of grazing land is well adapted for sheep culture, the largest flock in the Territory belonging to a single corporation and shearing 400,000 pounds of wool. This flock numbers 53,000 head, and runs on its own ranges, while the small owner, with his 1,000 sheep, enjoys the same privileges of Government pasturage. The number of sheep in this county is 500,000, for the most part graded merinos, averaging 6 pounds of wool. Loss from storms and scab is small, being less than 6 per cent annually, while the increase for the past ten years has averaged 80 per cent. The clips are sold in the railway towns in July and August to the buyers who come from the East, the average price for 1898 being 12 cents per pound.

CATTLE.

Formerly Union County was one vast range on which grazed hundreds of thousands of cattle. The day, however, of the cowboy and large herds of cattle is a thing of the past and has disappeared. The county tax books show that 40,000 head of cattle are still left and being carefully looked after and fed by farmers who own from 50 to 600 head each. These are well-graded Herefords and Shorthorns, and are proving a paying investment to their owners. They are either marketed or sold to buyers from Kansas or Colorado.

RAILROADS.

Union County is crossed by the Union Pacific, Denver and Gulf Railroad, a road running from Denver, Colo., to Fort Worth, Tex., a distance of 780 miles, which enters the county at a point near Folsom and leaves it at Texline, Tex. This road, which was built in 1888, has during the past five years improved greatly its roadbed and rolling stock, until it has become one of the best roads in the West. Its passenger service is, because of its new and excellent coaches and fast-running trains, worthy of particular mention, and the traveler, leaving New Mexico one morning, reaches by close connections the city of Denver the same afternoon and Chicago the following evening. The road has, in way of improvements in Union County for the first six months of 1898, laid 10 miles of 65-pound steel in place of 52-pound rails; has fenced 41 track miles or 82 linear miles; has ballasted 25 miles of roadbed 15 inches deep with cinders, besides building sheep-dipping plants at both Folsom and Clayton with a capacity of 10,000 sheep daily.

A new and roomy station has also been erected at Clayton, equipped with electric lights. This road is a most patent medium in moving New Mexico cattle to northern ranges, and thousands of head are driven annually from the Pecos River district, in southern New Mexico, to Clayton and Folsom, where they are shipped to Wyoming, Montana,

and Eastern markets. In the fall of the year no less than 200,000 sheep are also carried by the Denver and Gulf road to Colorado feeding points.

SCHOOLS.

Union County has two new school buildings, made of pressed brick and native sandstone, one at the county seat, Clayton, costing \$10,000, and the second, completed during the past year, at Folsom, at a cost of \$9,000. Several new edifices for educational purposes have been erected in the interior during the past few years to accommodate the needs of the growing population, and the gain in matters of education is a very considerable one.

The average length of school terms in this county is eight months.

COAL.

Coal has been found in several portions of the county in considerable quantities, and it is of excellent quality. The best is found on Johnson's Mesa. The coal fields being some distance from the railway they are being slowly developed, using it almost entirely for home consumption. The records of the land office show entries of 2,600 acres of coal lands in Union County.

Stone for building purposes, the white sandstone, is found in abundant quantities, also in different portions of the county. The quarry near Clayton now furnishes the material for the buildings of that town. Gold and copper, though not in paying quantities, have been discovered in the northern part of the county, and along the canyons of the Cimarron River.

COST OF LIVING.

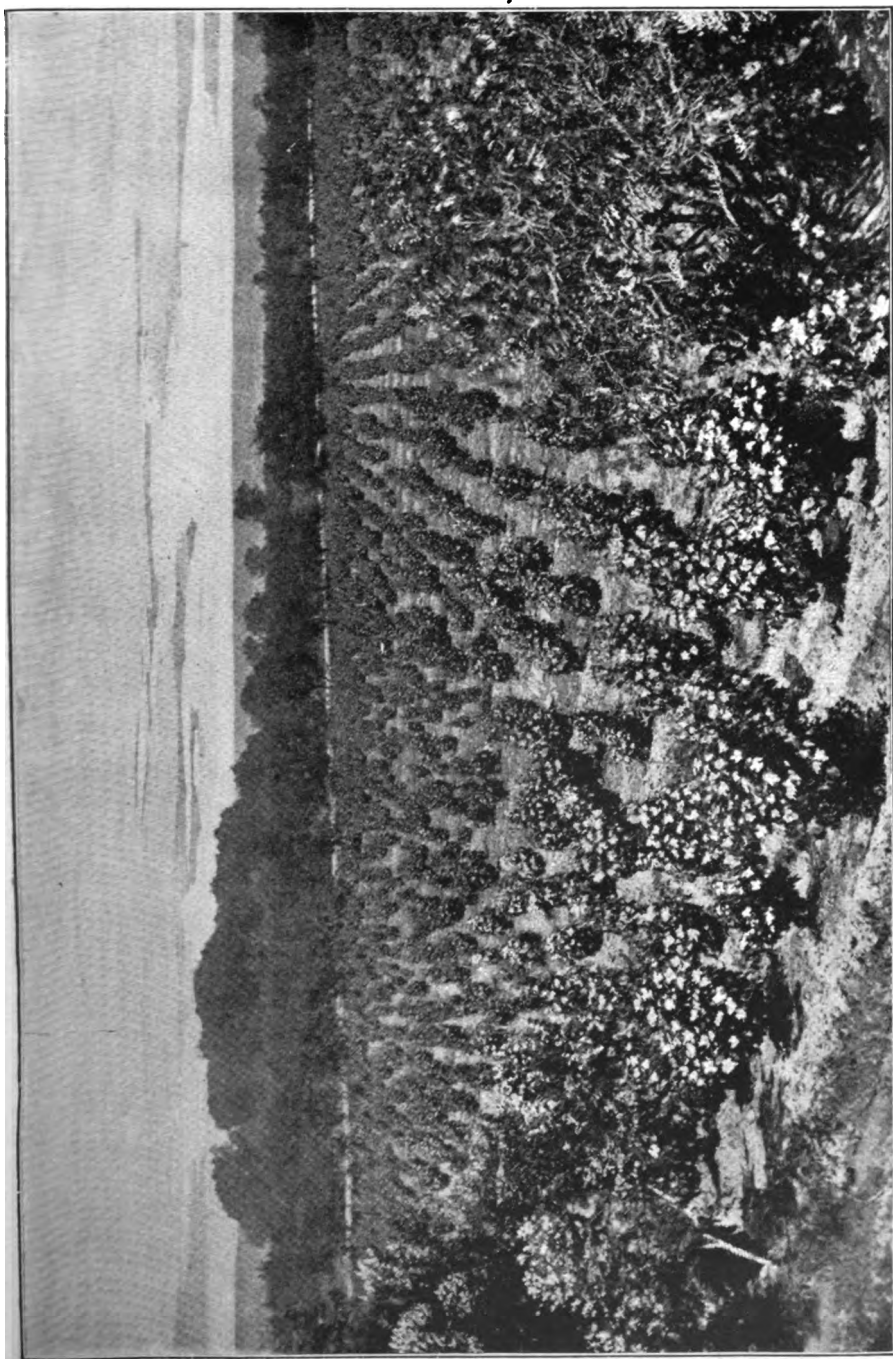
Exceptional inducements are offered the homeseeker in this county. Should he wish to engage in ranching he may select his homestead from the thousands of acres of Government land at a cost of \$16 for his 160 acres. He will find the expense of living not materially different from that in the East. Flour costs \$2.80 per 100 pounds; meats and grain are cheaper than they are in the far East, and groceries at prices charged in Denver or Kansas City, and in this climate of sunshine, after a few years, the summer heat of eastern districts unknown in the arid portions of the West and the rigors of severe winters of the Orient, will hold out no inducements to him to leave the country of his adoption.

VALENCIA COUNTY.

Valencia County is one of the largest counties of New Mexico, reaching from the Arizona line on the west to the line of Guadalupe County on the east. The western as well as the eastern high plateaus of the county afford splendid pasture for several hundred thousand head of sheep, whose owners, under the present prosperous condition of the sheep business are growing rapidly rich.

Fine bodies of timber lands are found in the Manzano and Zuni mountains, while the Rio Puerco Valley is known to contain large beds of coal, gypsum, and a superior grade of building stone.

Farming is almost exclusively confined to the valley of the Rio Grande, which river flows from north to south through the center of the county. The soil here is extremely rich, and is being made better year by year through the application of river sediment which is brought onto the land by means of irrigation. Wheat yields abundant crops of



VINEYARD, VALENCIA COUNTY.

a superior grade; corn, oats, barley, and beans can not be surpassed for yield and quality, while in the way of horticulture the county is destined to take a prominent place among the fruit-producing counties of the Territory.

Apples, pears, and peaches are grown profitably, while of grapes we have not only the justly celebrated Mission grape, but also such other European varieties as the Tokay, the Muscat, etc.

Alfalfa is grown here in large quantities and brings good returns; vegetables of all kinds and varieties yield surprisingly large crops with but little labor and care.

On the western mesas of the county the canaigre root is found in abundance. As the demand for this root increases from year to year for tanning purposes, an important industry will be developed in that line within the course of a few years.

Sugar beets have been planted in a small way in different parts of the county. Tests made of them have given highly satisfactory results as to percentage of sugar and purity, with indications of a yield of about 30 tons to the acre. As soon as a sugar factory is established somewhere in the valley of the Rio Grande a large portion of the farming land of the county will be devoted to beet raising.

RAILROADS IN NEW MEXICO.

The Atchison, Topeka and Santa Fe Railroad, one of the greatest systems of railroads in the entire country, traverses the Territory of New Mexico from north to south, with numerous branches running into the mountains. The general direction of the road from the Colorado State line at Raton Pass to Rincon Junction is nearly south. From Rincon Junction to Deming its direction is southeast-westerly, and to the Texas line south-southeast. Connection is made with Santa Fe by an 18-mile branch from Lamy Junction.

The Denver and Rio Grande affords the means of ingress from the north by the way of Denver, and is undoubtedly the most magnificent scenic line ever built. To other sections stage lines afford communication and transportation over the best roads in the world, and the tourist, health seeker, or the scientist need have no fear of experiencing discomforts in traveling through New Mexico. This road runs about 175 miles through our Territory.

The Pecos Valley and Northeastern Railroad extends 89 miles from Pecos City, Tex., northward to Eddy, the county seat of Eddy County, and 73 miles to Roswell, the county seat of Chaves County. The road was completed in 1890 and the extension from Roswell, N. Mex., to Amarillo will be 208 miles, making the entire length of the line 372 miles. The Roswell extension enables the southeastern part of the Territory to also have immediate connection with the Denver and Gulf, giving a connection in addition to the Texas and Pacific route as well as with Denver, Colo. By next spring southeastern New Mexico will be able to ship stock and its varied products directly to larger markets without having to drive across the country to the Santa Fe, in central New Mexico, or to ship around through Texas, over the Texas and Pacific, to Fort Worth, Tex.

The Union Pacific, Denver and Gulf Railroad is built through Union County in the northeastern corner of this Territory for a distance of about 80 miles. A great quantity of stock is shipped over this road from Clayton, the county seat of Union County.

The Southern Pacific Railroad extends entirely across the south-

western part of New Mexico, running almost due east from Stein's Pass, where it enters the Territory on the western boundary, and connects at Lordsburg for the Clifton copper mines; at Deming with the Atchison, Topeka and Santa Fe system, and at El Paso with the Texas Pacific and Galveston, Harrisburg and San Antonio. About 150 miles of the Southern Pacific runs through New Mexico.

The Alamagordo and Sacramento Mountain Railway has completed its line from Alamagordo up to the Sacramento Mountains, a distance of 15 miles. These mountains are particularly noted for their very heavy growth of timber, and the building of this road will be the means of opening up considerable improvements in that section of New Mexico.

The Santa Fe Pacific (formerly the Atlantic Pacific Railway), beginning at Albuquerque, on the Rio Grande, extends in a westerly direction to the western boundary of New Mexico, taking in about 200 miles of the Territory, and continues on to the Pacific coast, in California.

The Silver City, Deming and Pacific Railway runs from Deming to Silver City, a distance of about 45 miles. This is a branch of the Atchison, Topeka and Santa Fe road.

Several important railway lines from the East are headed toward New Mexico, and will build through our Territory.

It will be seen from the course of the above roads that New Mexico possesses the advantage of easy access, and I believe that the next year will show many miles of new roads through our Territory, which will tend to open up new country and add largely to our wealth and development.

The New Mexico exhibit at the Omaha Exposition, as shown by the report of Hon. J. J. Leeson, manager, follows:

As commissioner and manager of the New Mexico exhibit at the Trans-Mississippi and International Exposition held at Omaha, Nebr., from June 1 to November 1, 1898, I respectfully submit the following report:

The States and Territories making exhibits here have revealed to the world their great wealth and wonderful resources, and it is but just and right that honors should fall where honors are due. Nebraska should be honored by her sister States and Territories and the entire world, more especially when our nation is engaged in a great war with a foreign power, for the enterprise she has shown in bringing about such an enormous and creditable exposition. This is only second to the great World's Fair at Chicago, and in many ways it even surpasses that. Each State and Territory should be honored for its valuable assistance in showing, through the medium of this exposition, its wealth and resources. Many of them made most creditable exhibits and will greatly profit thereby, and none can hope to be more benefited than our own great Territory. I say this for several good reasons.

First. New Mexico has the finest all-year climate on the whole American continent.

Second. New Mexico has more land open to location and preemption for the prospector or farmer than any State or Territory in the Union.

Third. New Mexico has more grazing lands than any other State or Territory.

Fourth. New Mexico has the finest home market for her products of any State or Territory in the Union.

Fifth. New Mexico is by far the best sheep and stock country.

Sixth. New Mexico offers a better field to-day to the capitalist, manufacturer, mechanic, or farmer than any country now known.

The exhibit of our Territory now at Omaha is not only a credit to New Mexico, but to the nation.

The mineral exhibit embraces some 50 tons, representing over 85 districts, and for size, richness, and variety was not surpassed by any State or Territory. We exhibit nothing but New Mexico productions, and while, owing to our financial condition, we were not able to purchase regular mineral cases and mount and classify every specimen, yet the mineral exhibit of New Mexico is the admiration of all who see it and is the attraction of the exposition.

The agricultural exhibit is very fine. It embraces over 125 varieties of wheat, 19 of oats, 8 of barley, 11 of rye, 2 of rice, besides a great many varieties of other cereals and a magnificent assortment of grasses. The fruits and vegetables are very fine. Especially must this be said of the exhibit of the Pecos Valley Irrigation

Company, the Maxwell Land Grant Company, and the agricultural college at Las Cruces, N. Mex.

There is also a very interesting sugar-beet exhibit from Eddy, N. Mex., showing the process of the beet to pulp and from pulp to sirup, then to brown sugar, thence to a lovely white granulated sugar. This display has proved a great advertisement for New Mexico.

The horticultural display is very fine, demonstrating the fact that the sunshine, soil, irrigation, and climate is peculiarly adapted to the successful raising of large, handsome, fine-flavored fruit of all kinds.

The stock and wool interest is well represented by fine samples of wool of various improved grades.

The fine arts and historical exhibit of New Mexico is one of the most interesting features of the exposition, and is too numerous to mention in this report. Among the most prominent, however, is the gold and silver filigree table, the property of the Woman's Board of Trade of Santa Fe; New Mexico's famous old bell; the old bottle iron snake, compass, madstone, and petrified peach.

In the line of literature I received from the bureau of immigration the Eddy Argus; from the Santa Fe Railroad Company the Albuquerque Democrat and the Weekly News, over 100,000 copies, which I distributed to visitors; also many copies of the Governor's annual report, which has attracted widespread attention, the distribution of which, being an official document, will greatly benefit New Mexico. Besides these distributions New Mexico has received over 120 columns of write ups in the various leading newspapers of the great North and West, the value of which can not be calculated.

The Santa Fe Railroad has done everything in its power to assist us, and too much praise can not be accorded that route by the people of our Territory. Mr. W. B. Biddle, the freight traffic manager, and Mr. John E. Frost, of the land department, personally rendered very valuable assistance and demonstrated great interest in the progress and growth of New Mexico.

At the conclusion of the Omaha Exposition I shall render to you a full and complete report of the New Mexico exhibit.

THE PRESS.

Of the 18 counties in New Mexico, newspapers are published in 15. Cities, towns, and villages in which papers are published number 30, of which 14 are county seats. Of the 56 papers published in New Mexico 5 are daily, 1 triweekly, 47 weekly, and 3 monthly.

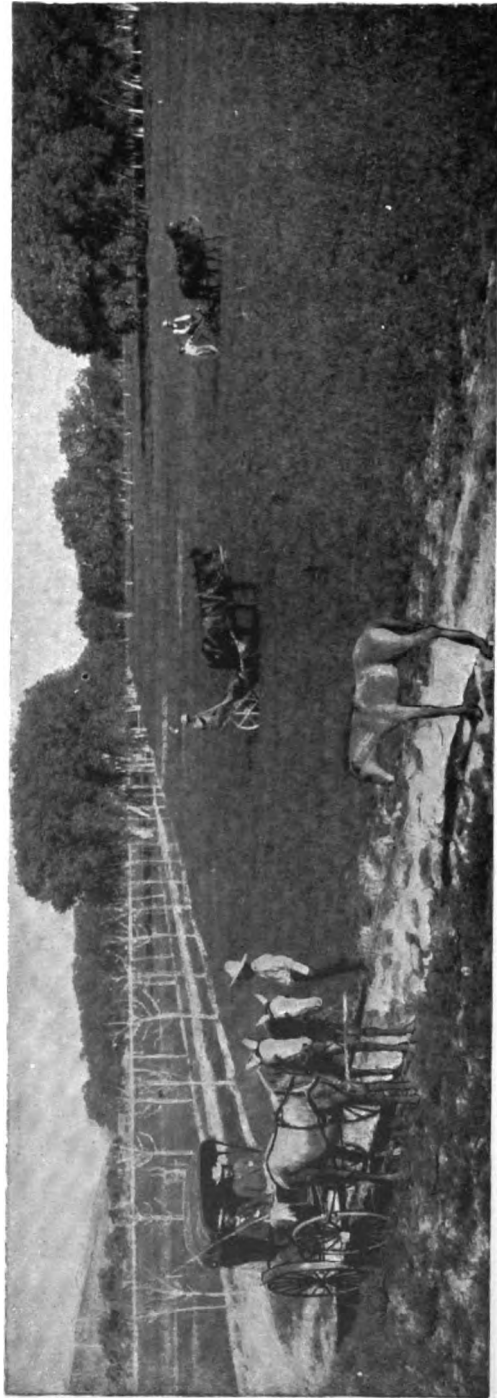
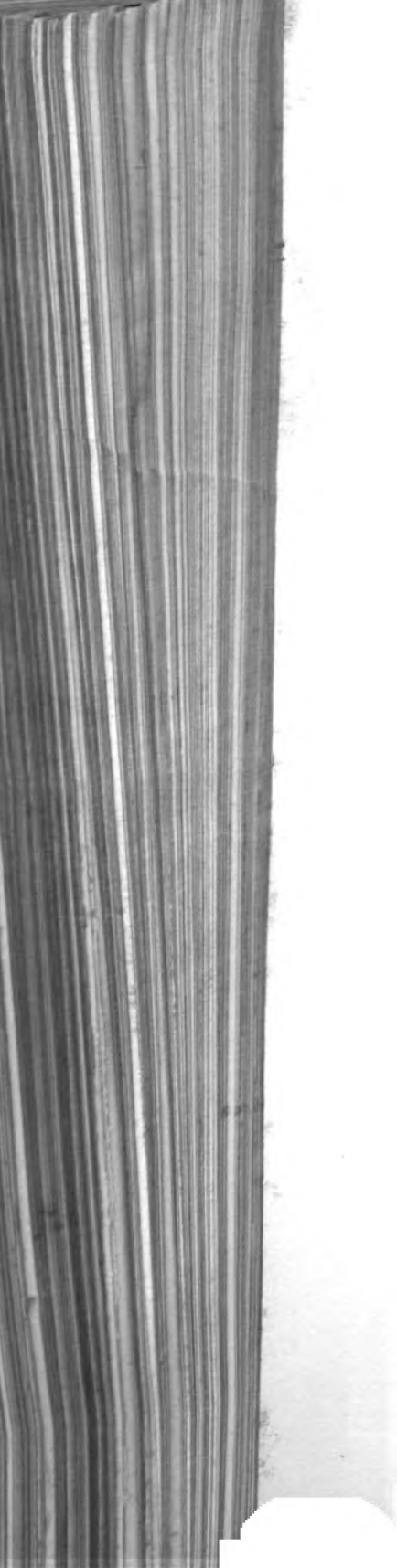
Politically the papers are divided as follows: Republican, 19; Democratic, 18; religious, local, etc., 11; independent, 8. The papers, particularly the dailies, have large circulations and are influential in their respective communities.

Much of the development of the Territory is due to the energy and enterprise of the newspaper men, which has been a labor of love, for in New Mexico, like in many other States and Territories of our Union, the newspaper business is not, from a purely financial standpoint, a lucrative one.

Following is a list of the newspapers printed in New Mexico:

Albuquerque, Bernalillo County:	
Abogado Cristiano Neo Mexicano (Spanish and English).....	Methodist.
Bandera Americana (Spanish).....	Republican.
Citizen	Republican.
Citizen (weekly).....	Republican.
Morning Democrat.....	Democratic.
News	Independent Republican.
Nuevo Mundo (Spanish).....	Independent.
Aztec, San Juan County:	
San Juan County Index.....	Independent.
Bland, Bernalillo County:	
The Herald (weekly).....	Independent.
Cerrillos, Santa Fe County:	
The Rustler.....	Local.
Chloride, Sierra County:	
Black Range.....	Republican.

Clayton, Union County:	
Enterprise	Republican.
Union Democrat (English and Spanish)	Democratic.
Deming, Grant County:	
Headlight	Democratic.
East Las Vegas, San Miguel County:	
Optic (daily)	Silver Democratic.
Optic (weekly)	Silver Democratic.
Voz del Pueblo (Spanish)	Independent.
Eddy, Eddy County:	
Current	Democratic.
Pecos Valley Argus	Independent Republican.
Elizabethtown, Colfax County:	
New Mexico Miner	Silver Democratic.
Farmington, San Juan County:	
San Juan Times	Democratic.
Folsom, Union County:	
Independent	Silver Republican.
Gallup, Bernalillo County:	
Gleaner	Independent Democrat.
Hillsboro, Sierra County:	
Sierra County Advocate	Democratic.
Labelle, Taos County:	
Cresset	Independent.
Las Cruces, Donna Ana County:	
Donna Ana County Republican	Republican.
Independent Democrat	Democratic.
New Mexico Collegian (monthly)	Collegiate.
Rio Grande Republican	Republican.
Southwestern Farm and Orchard (monthly)	Agricultural.
El Tiempo (Spanish)	
Las Vegas, San Miguel County:	
Independiente (Spanish)	Republican.
Optic (see East Las Vegas)	
Revista Católica (Spanish; edited by Jesuit fathers)	Catholic.
Stock Grower and Farmer	Stock and agriculture.
Lincoln, Lincoln County:	
News (English and Spanish)	Democratic.
Lordsburg, Grant County:	
Western Liberal	Republican.
Mora, Mora County:	
Anciano (Spanish)	Protestant.
Raton, Colfax County:	
Range	Republican.
Reporter	Democratic.
Red River, Taos County:	
Mining News	Independent.
Roswell, Chaves County:	
Record	Democratic.
Register	Independent.
San Marcial, Socorro County:	
Bee	Republican.
Santa Fe, Santa Fe County:	
Boletin Popular (Spanish)	
New Mexican (daily)	Republican.
New Mexican (weekly)	Republican.
Nuevo Mexicano (Spanish)	Republican.
Silver City, Grant County:	
Eagle	Democratic.
Enterprise	Republican.
Independent	Independent Democrat.
Socorro, Socorro County:	
Chieftain	Republican.
Industrial Advertiser	Democratic.
Springer, Colfax County:	
Colfax County Stockman	Democratic.
Tulerosa, Dona Ana County:	
Chief	Republican.
White Oaks, Lincoln County:	
Eagle	Democratic.



RIO GRANDE VALLEY RANCH

RESOURCES.

The resources of New Mexico are boundless, and the possibilities of development in the Territory of New Mexico in numerous directions are unequaled by those of any other State or Territory in the Union. On account of the varied elevation almost everything that flourishes in the temperate zone, and many fruits that belong to the Tropics, grow to perfection in New Mexico. As a stock country it is excelled by none, in addition to which large, rich deposits of gold and silver, coal, iron, copper, sulphur, marble, building stone, and many different kinds of precious stones are found; New Mexico being the principal source of supply of the world for turquoise, which is of the finest quality and color. What we need to develop the mines, as well as the agricultural, stock growing, and other capabilities of our Territory is capital, and large fortunes are in store for those who have the money and industry to develop the wonderful resources of New Mexico. New Mexico needs more people; people who can invest in her mines and other industries which, if developed, would make our Territory one of the richest on the globe, and when the world at large becomes convinced of this, New Mexico will enter upon an era of prosperity never before dreamed of.

The ranges for sheep and cattle were never in better shape, and stock of all kinds is in excellent condition. The herds and flocks have increased in size and value very materially since the opening of the year, and with plenty of grass assured the sales of sheep and cattle this fall will bring large sums of ready money into the Territory.

Every prediction made for prosperity early in the year is now in a fair way to be fulfilled, and New Mexico will exceed almost all former yearly records in the amount of revenue derived from produce, sheep, and cattle at the close of the year's work.

GOATS.

Goat raising is an industry that has prospered here on a small scale for a century or two, but just now there is a boom on and several large ranches are being started, some with the special idea of raising goats for the hides, which are used on a larger scale in this country than most people are aware of. Others are branching out in the Angora breed for the hair, which is coming more and more into use. There is no doubt but what this industry, properly managed, will prove to be very remunerative.

OFFICE OF SUPERINTENDENT UNITED STATES FOREST RESERVES,
Santa Fe, N. Mex., October 1, 1898.

DEAR SIR: I cheerfully comply with your request to furnish a brief report upon the Pecos River forest reserve.

This reserve was created by proclamation of President Cleveland, issued on January 11, 1892, and was enlarged to its present size by proclamation of President McKinley bearing date of May 27, 1898.

It comprises a body of land about 24 miles wide by 25 miles long, whose western boundary is about 8 miles east of the city of Santa Fe.

The main purposes of its formation are: First. To protect the timber growing on such reserve from destruction by forest fires and prevent the unlawful cutting of timber.

Second. To protect the snows by encouraging a dense undergrowth of young timber upon the mountain sides, thus furnishing to the many useful streams whose headwaters are found within the limits of this reserve a steady flow of water during the spring and summer months. This feature, the protection of the water supply of this region, is one of vast importance to the Territory of New Mexico, and its practical value may be readily shown by noticing how quickly the irrigating ditch converts

an arid, desert region into a fertile farm capable of producing fruits, vegetables, and cereals as great in quantity, quality, and variety as can be found anywhere in the United States.

Among the most important streams having their source upon this reserve, and which furnish water to the valleys into which they flow, are the following: Rio Grande del Rancho, Rio del Pueblo, Rio de Santa Barbara, Rio Chiquito, Rio Las Trampas, Rio del Pueblo Quemado, Rio del Medio, Rio de Los Frijoles, Rio de Panchuelo, Rio de Namba, Rio Tesuque, and Rio de Santa Fe. These streams have their sources upon the northern and western slope and their confluence is with the Rio Grande. The principal streams of the eastern slope are the Agua Negra, Rio de Las Casas, Rio de la Cebolla, Rio de Manulitas, Rio de Sapello, Rio de Gallinas, and Rio de Tecolota, while within the central and southern portions rises the Rio de Pecos and its countless feeders, Rio de la Vaca, Rio de Manzanares, and Rio del Toro.

The forests in the higher altitudes are of pine, balsam, fir spruce, and quaking asp, while along the foot hills and lower altitudes cedar and piñon are found.

There are two mountain ranges in this reserve, the Santa Fe range and the Las Vegas range. Their altitudes vary from 8,000 feet to 13,306 feet above sea level. Of their mineral wealth but little is known; owing to the short seasons which prevail and their remote location, very little prospecting and no practical mining has ever been done. There are many instances where float rich in gold, iron, and copper has been found, but there has as yet been no well-organized effort to locate the same.

This reserve forest furnishes to the citizens of Santa Fe, Albuquerque, Las Vegas, and other towns of the Territory, a most fascinating and healthful summer resort. The numerous streams sparkle with the purest water and abound in mountain trout.

The hillsides and valleys are covered with beautiful groves of trees, and the sportsman who can climb the mountain sides will find a supply of deer, wild turkey, grouse, squirrels, and rabbits, with an occasional bear and mountain lion.

The Government now has six men stationed upon this reserve, called "forest rangers," whose duty it is to constantly patrol their respective allotments of territory and protect the reserve from loss by fire and depredation. In this connection it is pleasant to note that the best thinking people of the Territory are heartily supporting the Government in its efforts to protect the forest reserves from ruthless destruction, and it is earnestly hoped that our efforts in this direction will result in enhancing the material prosperity of New Mexico.

Respectfully submitted.

JOHN D. BENEDICT,
Forest Superintendent.

Hon. MIGUEL A. OTERO,
Governor of New Mexico.

MORAL CONDITIONS.

The material prosperity of the Territory of New Mexico is not more marked than is its moral advancement. The various fraternal societies are well represented, and there are a number of trade and labor unions.

The various church organizations are in charge of refined and cultured men, and are well represented. The following named churches are all well attended throughout the Territory in every county and city: Catholic, Episcopal, Methodist Episcopal, Methodist Episcopal South, Presbyterian, Congregational, Christian, Baptist, Mormon, African Methodists, African Baptists, and others.

The fraternal societies in existence here are as follows: Masonic, Knights Templar, Thirty-second Degree Scottish, Odd Fellows, Knights of Pythias, Ancient Order of United Workmen, Woodmen of the World, Elks, Red Men, Mystic Shriners, Junior Order of Mechanics, the different railroad organizations, and others.

We also have a large organization of the Grand Army of the Republic, with posts at different localities in the Territory. Their annual reunions are always looked forward to with great pleasure by the old soldier residents of our Territory.

GAME AND FISH.

All parts of our Territory abound in game and fish; in fact, New Mexico is noted as being a paradise for the sportsman.

In nearly every mountain range can be found mountain lions, bears, lynxes, wild-cats, deer, mountain sheep, Rocky Mountain goats, wild turkeys, and grouse, while on the plains and in the valleys can be found quail, pheasants, Mongolian or Chinese pheasants, prairie chickens, and antelopes, and during the seasons geese, brant, ducks, plover, and snipe.

The mountain streams are well stocked with trout, while the numerous lakes and rivers are stocked with other game fish, the Government two years ago having supplemented the natural supply with a large number of different kinds of fish through the United States Fish Commissioner.

The Territory has an excellent law protecting game and fish, prohibiting the sale or exportation of either, or their wanton destruction. This law is enforced by efficient game wardens appointed by the governor in each county, who look sharply after its enforcement; the penalties for violation of the law are heavy, and the result is that every portion of the Territory is abundantly supplied with both game and fish for the sportsman. The law provides a bounty to anyone killing mountain lions, wolves, or bears.

The season for killing deer and antelopes (with horns only) is during the months of September, October, and November of each year.

The season for shooting quail, grouse, prairie chickens, pheasants, partridges, or wild turkeys is during the months of September, October, November, December, January, and February of each year. It is unlawful to kill or wound, ensnare or trap any Mongolian or Chinese pheasant in this Territory at any time for a period of five years from March 10, 1897.

The season for trout fishing begins on June 1 and ends on October 31 of each year, and bass fishing begins on July 1 and ends on January 31 of each year.

The sportsman visiting New Mexico need have no fear regarding accommodations, as proper conveyances can be secured at any point on the railroad by giving short notice; while at any of the principal towns he will find livery stables well supplied with teams and mountain wagons especially kept for the convenience of hunting and fishing parties, and who can furnish reliable drivers who are familiar with every desirable locality in their section of the Territory.

UNDEVELOPED RESOURCES.

The Territory of New Mexico is a most inviting field for capital and skilled labor, having undeveloped resources almost without limit. Millions of acres of the finest agricultural land are yet to be reclaimed by the development and proper storage of water. Communication by enlarged and cheaper railroad facilities between the various portions of the Territory is earnestly hoped for, that an interchange of home products between the mining and agricultural sections may be carried on.

A large extent of New Mexico's rich mineral lands yet remains to be explored and developed. Her grazing lands have not been fully used, owing to the failure to develop artesian water (of which the finest in

the world is found here) and erect surface windmills, the opportunities and conditions for which are excellent.

The opportunities of industrial life offer varied and profitable inducements to capital and labor, and the agricultural, mineral, and grazing wealth should receive from outside investors the attention they deserve.

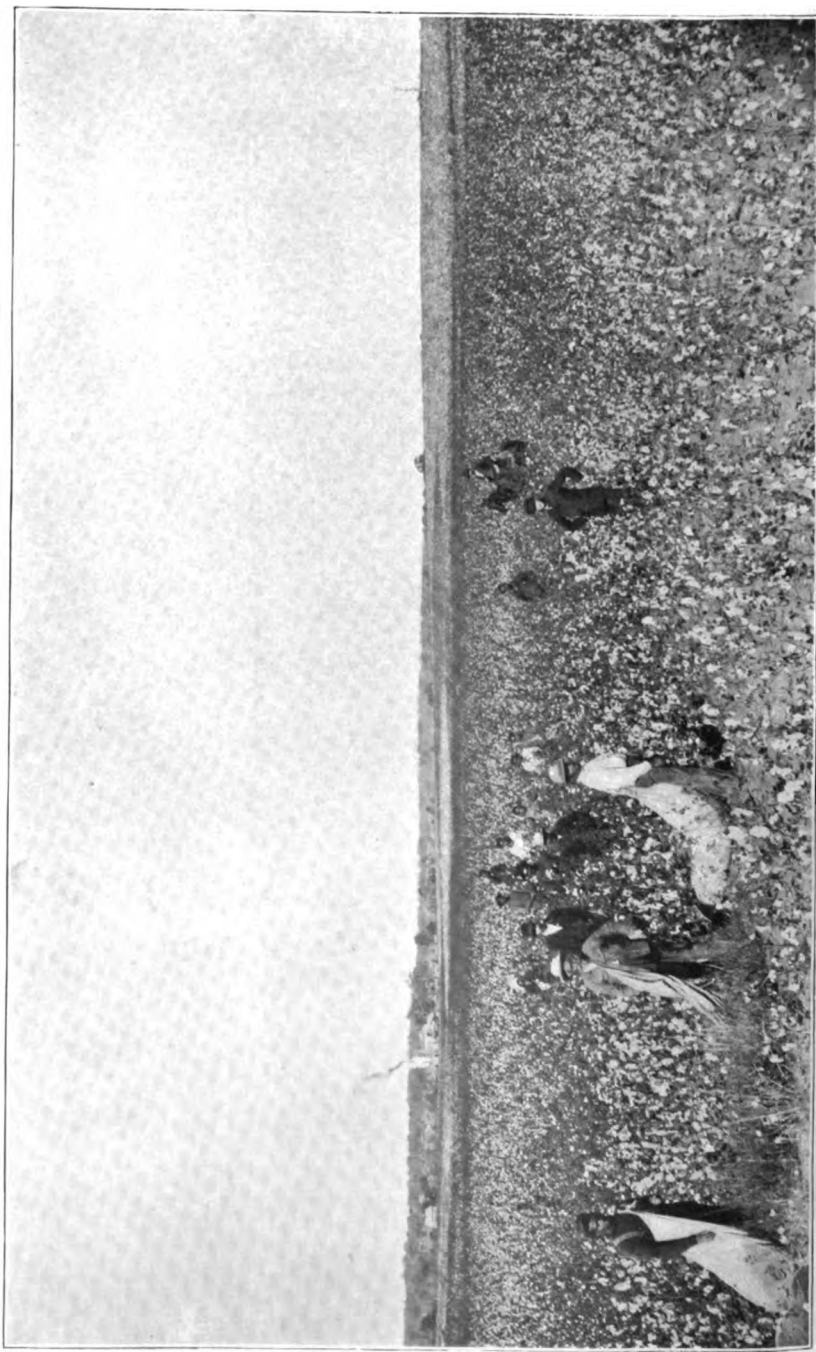
Factories might also be started with profit. In this Territory there are many plants and grasses of indigenous growth that could be used in the manufacture of paper, bagging, rope, etc. Some of the hard woods growing in this Territory, at the base of the mountains, when dry take a beautiful polish, which produces a veneering of excellent quality. Eastern manufacturers could be supplied with this article who now obtain their product from other countries. A full report is given elsewhere on the lumber and forestry of our Territory.

Respectfully submitted.

MIGUEL A. OTERO,
Governor of Territory of New Mexico.

SANTA FE, N. MEX., *October 1, 1898.*

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OKLAHOMA COTTON FIELD.

REPORT
OF THE
GOVERNOR OF OKLAHOMA.

GUTHRIE, *September 1, 1898.*

SIR: I have the honor to submit the following report of the condition and progress of the Territory of Oklahoma for the year ending June 30, 1898, believing that it tells a story of progress, prosperity, and development never before equaled in the history of the States and Territories of the United States.

GENERAL OBSERVATIONS.

With a population aggregating a third of a million and greater than that of any other Territory and half a dozen different States of the Union; with an area of 40,000 square miles or 24,499,680 acres; with a prosperous, contented people largely engaged in agriculture and kindred pursuits and producing crops that astonish the world; with a taxable valuation exceeding forty millions of dollars; with a commerce that has doubled and trebled in the past twelve months; with a smaller bonded debt than any other State or Territory, and the small amount there is having been incurred only for the erection of educational institutions; with a public school system equal to any in the land; with better facilities for higher educational training of her youth than many States five times as old and with many times the population; with the best of transportation facilities and almost unlimited natural resources; with a fertile soil, a delightful climate, bright sunshine, and health-giving breezes, Oklahoma extends a cordial invitation to the farmer, the stock raiser, the fruit grower, the manufacturer, the investor, the invalid, and the homeseeker of every class to come and better his condition and challenges comparison with any other equal area of the continent.

Our north boundary is 37° north latitude. Except in Greer County little of the Territory extends south of the thirty-fifth parallel. In latitude it corresponds with southern Kentucky and Tennessee. Except Beaver County, which extends in a strip 35 miles wide to the one hundred and third meridian west longitude, nearly all the Territory lies between 96° 30' and 100° west longitude, being in the same belt as central Kansas and Texas.

In general, the face of the country is rolling prairie, with a considerable number of rivers and streams usually flowing from the northwest to the southeast, and often having high and steep banks. In the eastern half there are considerable areas covered with timber, usually of the different varieties of oak. Timber is found in the valleys of the streams in all parts of the Territory.

The altitude increases from east to west. Most of the better settled portion of the Territory is between 800 and 1,400 feet above sea level.

The soil of the Territory varies greatly in appearance and considerable in composition, but it is, on the whole, fertile and well supplied with plant food.

The rainfall during the winter months is light, but most years it is abundant in the growing season in every part of the Territory, and as a result Oklahoma can produce most of the great field and orchard crops grown in the States North and South, and is well adapted to rearing and fattening each of the great classes of farm animals.

THE FARMER OUR MAINSTAY.

The Oklahoma farmer is to-day prosperous, happy, and contented, and with his success has come prosperity to the whole Territory. During the nine years of the existence of the Territory the farmer has gone through many hardships and encountered many difficulties, but he kept bravely on, surmounted every obstacle, and is to-day as prosperous as any man in the nation.

Coming into a new and unknown country, settled under conditions which rendered inevitable controversy over the possession of his land; coming, in most instances, with only such few possessions as could be loaded with his family in a single wagon and what little cash was in his pants pocket, the pioneer Oklahoman conquered the wilderness, broke the trackless prairie into field and garden, experimented until he found the things which best would grow and yield, and learned the time to plant and to reap; kept bravely on, no matter what the odds, and to-day has his reward in a comfortable home, a productive farm, and a bright future.

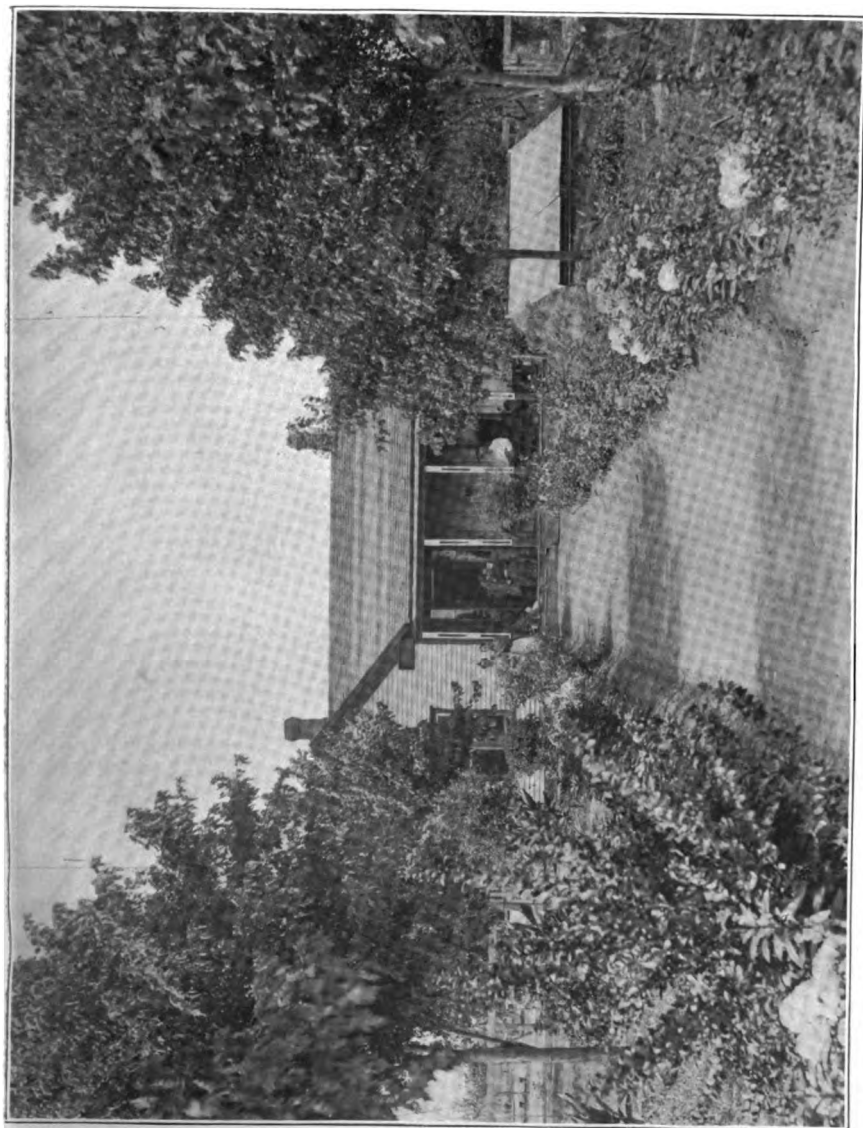
True, there were days when his home was a dugout or a cottonwood shack, when his family were in rags, when his farm was unproductive, when his future was anything but bright, but he forgets all these things in the comfort and content of to-day.

His family is clothed in comfort, his home is a substantial structure, he rides to church or to town in a comfortable carriage instead of the creeping white-topped schooner, well-fed stock roam his fields, growing crops are all about him, orchards are fruiting on every side, and feed and grain are found in his barns, while a schoolhouse is within easy reach of his children and a college almost at his door.

POPULATION.

Oklahoma's growth of population has been as remarkable as her development along other lines. From an unbroken, uninhabited prairie, in a single day she sprang into existence as a community of three score thousand souls.

The census of 1890 gave the Territory, then barely organized, a population of 61,834, but on several occasions since the Territory has increased its population 50 per cent or more in a single day by the settlement of Indian lands thrown open to homestead entry. For several years there have been no openings of reservations and hence no such sudden increase in population, but the tide of immigration from all parts of the United States has been an unceasing one and the peopling of some of the counties has been unprecedented for a steady growth without the attendant elements of boom or rush. Some of the western counties of the Territory have more than doubled in population



AN OKLAHOMA FARM HOME.

since the taking of the Territorial census in 1896. We give here a table showing population of the counties as returned in 1896 and again in 1898:

County.	1896.	1898.	County.	1896.	1898.
Beaver	4,778	2,548	Logan	19,995	23,589
Blaine	6,415	8,527	Noble	13,402	10,421
Canadian	12,837	18,336	Oklahoma	19,999	20,324
Cleveland	13,006	15,426	Pawnee	8,293	10,795
Custer	5,296	6,482	Payne	14,192	17,386
D	2,986	4,129	Pottawatomie	17,300	22,504
Day	611	843	Roger Mills	1,267	2,262
Garfield	16,092	16,228	Washita	5,404	9,468
Grant	16,575	14,319	Woods	20,805	24,414
Greer	8,500	10,132	Woodward	7,487	4,206
Kay	16,959	18,000	Reservations	12,500	13,033
Kingfisher	15,346	16,044			
Lincoln	16,542	21,884	Total	275,587	311,400

^a Estimated.

This shows the present population of the Territory to be 311,400, a gain of 13 per cent in two years. But the enumeration taken by the township assessors has always been found to be much less than the actual population, as they miss almost all of the transient population of the towns and cities, who do not list property for taxation, and it is therefore reasonably certain that the population of the Territory at this time is fully a third of a million.

Energetic, enterprising, pushing, and progressive, the people of Oklahoma have come to be known as the true type of successful Americans. They know no failure, give way to no difficulties, recognize no claims as paramount to those of their own beloved Commonwealth, and wherever they may be found are singing the praises of their land of sunshine and prosperity.

In no State in the Union is the percentage of foreign-born population so small, and the foreigners who are in the Territory are thoroughly naturalized and identified with American ways and American institutions. Coming from every State in the Union, the people are truly cosmopolitan, but they are united in one great determined endeavor to build here one of the grandest States of the Union, and to this end they have conquered a new and untried land, endured hardships, surmounted great obstacles, and are to-day bending every energy.

TAXABLE PROPERTY.

The return of property for taxation in the Territory for the year 1898 was as follows:

County.	Amount.	County.	Amount.
Beaver	\$1,421,158	Logan	\$3,493,962
Blaine	411,906	Noble	1,633,724
Canadian	3,597,368	Oklahoma	4,156,754
Cleveland	1,985,072	Pawnee	3,034,408
Custer	608,880	Payne	1,751,281
D	461,793	Pottawatomie	1,594,474
Day	348,638	Roger Mills	532,126
Garfield	1,929,349	Washita	979,561
Grant	1,426,243	Woods	2,532,563
Greer	1,219,460	Woodward	1,544,983
Kay	1,965,344		
Kingfisher	2,578,863	Total	40,623,816
Lincoln	1,425,886		

This shows an increase of \$8,589,064 over last year.

TAXES.

The taxes in Oklahoma are no greater than in any progressive community. The Territorial tax rate is less than in any Western State or Territory, being but 4.3 mills for all Territorial purposes, divided as follows:

General Territorial tax, 3 mills; normal-school tax, one-half mill; university tax, one-half mill; college-building bond interest tax, one-fifth mill; for the care and education of deaf-mutes, one-twentieth of a mill; for the care and education of the blind, one-twentieth of a mill. To this is to be added the county, township, school-district, or city taxes, but the total rate is not in any case exorbitant, and it is a significant fact that in almost every county and district the tax rate has been materially reduced the past year. The issuance of Government patents to homesteaders and the rapid increase in taxable wealth in every part of the Territory will result in still greater reduction the coming year.

TERRITORIAL INDEBTEDNESS.

The total bonded debt of Oklahoma Territory is but \$48,000, incurred in 1891 to erect buildings for the higher institutions of learning. In addition to this the Territory had outstanding on July 1, 1898, a warrant indebtedness of \$251,530.51, which had accumulated from casual deficits in the revenues from year to year since the organization of the Territory, the deficit being caused by failure to collect a large percentage of the taxes levied.

The following statement from the Territorial treasurer shows the business of his office during the past year, and gives the exact amount of warrant indebtedness at this time, together with the accumulated interest:

Warrants outstanding June 30, 1897	\$190, 138. 04
General fund warrants issued from July 1, 1897, to June 30, 1898	117, 797. 55
Accrued interest on outstanding general fund warrants (estimated)	15, 268. 00
	<hr/>
Warrants redeemed and cash in treasury June 30, 1898	323, 203. 59
	71, 673. 08
Outstanding June 30, 1898	<hr/>
	251, 530. 51

Interest paid for year ending June 30, 1898.

On bonded debt.....	\$2, 880. 00
On general fund warrants redeemed	7, 129. 89
On normal school warrants redeemed	243. 63
On university warrants redeemed	892. 80
	<hr/>
Total interest paid.....	11, 146. 32

The warrant indebtedness, as shown by the treasurer's statement, will be materially reduced by the collection of delinquent taxes, and the outstanding warrant indebtedness with the accrued interest may be fairly estimated to be not in excess of \$200,000.

From this statement it appears that the Territorial debt is insignificant, and when it is considered that no taxes were levied or collected during the first year after the organization of the Territorial government, that the bulk of the land has until the last year not been taxable, that in some counties the title to land is still largely in the name of the Government and nontaxable, and that the greater portion of the people of the Territory for years had very little personal property subject to



SOD SCHOOLHOUSE—FIRST YEAR.



SOD SCHOOLHOUSE—FIRST YEAR.

SOME OKLAHOMA DISTRICT SCHOOLS.

taxation, it is apparent that the Territorial finances have been well managed, and the wonder is that the debt is not very much greater than it is.

A comparison with the two other organized Territories of the United States, in a financial way, will show very favorable to Oklahoma:

As shown by the report of the governor for 1897 Arizona had a population of 87,500, a taxable valuation of \$30,613,702, and a bonded debt of \$965,588; New Mexico had at the same time a population of 242,000, a taxable valuation of \$36,396,748, and a bonded debt of \$959,000; while Oklahoma, with a population of 333,000 and a taxable valuation of \$40,623,816, has a bonded debt of but \$48,000 with a net warrant indebtedness of about \$200,000; making the debt per capita in Arizona about \$11, in New Mexico about \$4, and in Oklahoma less than 75 cents.

COUNTY INDEBTEDNESS.

The bonded indebtedness of the counties of the Territory is as follows:

County.	Amount.	County.	Amount.
Beaver	\$17,500	Logan	\$121,000
Blaine	24,800	Noble	35,000
Canadian	73,500	Oklahoma	138,500
Cleveland	79,000	Pawnee	15,000
Custer	13,200	Payne	77,500
D	9,050	Pottawatomie	51,500
Day	7,500	Roger Mills	9,450
Garfield	46,000	Washita	15,500
Grant		Woods	32,500
Greer (no debt)		Woodward	25,000
Kay	35,000		
Kingfisher	34,800	Total	926,300
Lincoln	67,000		

a No report.

OKLAHOMA PUBLIC SCHOOLS.

Common-school education in Oklahoma has received due attention. Growth in its schools has kept pace with material progress. The educational interests of the Territory are under the general supervision of the superintendent of public instruction.

The law also provides for a Territorial board of education, which in a large measure molds the educational policy of the Territory. All questions used in the examination of applicants to teach are prepared by this board; also regulations to be used by the county examining boards in conducting examinations.

This board issues certificates to applicants for conductor's and instructor's certificates to do normal-institute work.

It has been the special effort of this board to improve the condition of the district school. To this end a graded course of study was prepared about four years ago, that the opportunity of the children to receive the full benefit of the common-school course might be improved. It was printed in pamphlet form and put in the hands of teachers and patrons throughout the Territory. Provisions exist for the graduation of pupils on the completion of the course of study. Great interest is taken in the plan in most of the counties in the Territory.

Under provision of law an annual normal institute is held in each county. The general management of the county institute is a part of the work of the Territorial Board of Education. Each year a manual or course of study has been prepared by the Board to be used by the instructors and teachers as a guide in their institute work.

For the institutes of 1898 a graded course of study was prepared and used in all the counties in the Territory. This consists of a gradation of the subject-matter in the institute into three sections or divisions, provision being made for a normal-institute certificate to issue to the teachers on the completion of the work of a division, and a normal-institute diploma on the completion of the entire course. This plan leads up to the teacher's professional certificate to teach. It is adopted as a permanent feature of our school system and it is hoped that it will do much toward improving our common schools. The legal requirements for teachers are equal to those in the States, and it is gratifying to record the estimate of the intellectual and moral worth of Oklahoma teachers. It is the desire of our teachers to know and use the best methods in teaching, that the best results may be obtained. The term of service and wages are superior to some of the States. This is beginning to be realized, as is shown by the frequent inquiry by nonresident teachers for positions. A high professional sentiment will make it difficult for the nonprogressive teacher to find employment. Rapid progress has been made in attendance, and assurance is given of further advancement in the future.

When we think of the nearly one hundred thousand boys and girls of school age in the Territory, and of the more than two thousand teachers, then it is that we begin to have some conception of the necessity of proper organization and system in the management of a school system which guarantees an education to every child; and this Oklahoma has to an unusual degree.

There are in the Territory 1,879 school districts, with schoolhouses valued at \$454,574.68, under the Territorial insurance law, shown by the following tables:

Number of school districts in Territory by counties.

County.	No.	County.	No.
Beaver.....	42	Logan.....	97
Blaine.....	79	Noble.....	61
Canadian.....	84	Oklahoma.....	80
Cleveland.....	67	Pawnee.....	61
Custer.....	49	Payne.....	98
D.....	40	Pottawatomie.....	107
Day.....	12	Roger Mills.....	16
Garfield.....	127	Washita.....	60
Grant.....	121	Woods.....	226
Greer.....	61	Woodward.....	54
Key.....	88	Total.....	1,879
Kingfisher.....	116		
Lincoln.....	133		

Value of school property by counties.

County.	Value.	County.	Value.
Beaver.....	\$6,118.74	Logan.....	\$22,207.75
Blaine.....	10,450.50	Noble.....	31,294.00
Canadian.....	10,947.00	Oklahoma.....	30,778.25
Cleveland.....	25,516.30	Pawnee.....	17,214.79
Custer.....	2,119.00	Payne.....	33,750.00
D.....	2,033.50	Pottawatomie.....	30,068.89
Garfield.....	25,933.00	Roger Mills.....	5,230.40
Grant.....	30,704.52	Washita.....	6,492.82
Greer.....	11,366.71	Woods.....	25,601.94
Key.....	49,502.50	Woodward.....	7,295.50
Kingfisher.....	45,025.15	Total.....	454,574.68
Lincoln.....	26,908.50		



SECOND YEAR.



FOURTH YEAR.

SOME OKLAHOMA DISTRICT SCHOOLS.

This does not include value of school property in cities.

These school districts embrace every acre of settled land in the Territory and in each is held from four to seven months' school per annum, while in the large towns and cities are complete systems of graded schools and high schools, with from seven to nine months' school.

The country schoolhouses are nearly all comfortable frame or stone structures at this time and the towns have handsome and commodious buildings of brick and stone.

In the counties where there are any number of colored children separate schools are maintained and no child is without school privileges of the very best character.

The proceeds from the leasing of the school lands of the Territory, which are distributed per capita to every school district in the Territory, are the source of much revenue to the public schools and a great aid to carrying them on. During the past year \$1.34 was distributed for every school child in the Territory, making a total of \$121,383.90, divided among the different counties as follows:

Distribution of School Land Lease Money.

County.	Amount.	County.	Amount.
Beaver	\$1,218.06	Logan	\$9,657.88
Blaine	3,072.62	Noble	3,762.72
Canadian	5,621.80	Oklahoma	3,703.30
Cleveland	7,072.52	Pawnee	4,368.40
Custer	2,417.36	Payne	7,455.76
D	1,384.22	Pottawatomie	10,567.24
Day	326.96	Roger Mills	778.54
Garfield	6,571.30	Wahita	3,431.74
Grant	5,969.70	Woods	10,784.32
Greer	3,367.42	Woodward	1,697.78
Kay	6,677.22	Total	121,383.90
Kingfisher	7,174.30		
Lincoln	9,203.12		

The school enumeration for 1897 shows 90,585, and owing to the large immigration during the present year at this time is certainly 5,000 greater. I give below interesting tables showing the school population, by counties, last year; also the receipts and expenditures for school purposes in each county in the Territory:

Scholastic population.

County.	Population.	County.	Population.
Beaver	909	Logan	7,207
Blaine	2,293	Noble	2,806
Canadian	4,270	Oklahoma	6,495
Custer	1,804	Pawnee	3,260
Cleveland	5,278	Payne	5,564
D	1,033	Pottawatomie	7,886
Day	244	Roger Mills	581
Garfield	4,904	Wahita	2,561
Grant	4,455	Woods	8,048
Greer	2,513	Woodward	1,267
Kay	4,983	Total	90,585
Kingfisher	5,354		
Lincoln	6,868		

Receipts for the year.

County.	Balance on hand June 30, 1897.	From apportionment of Territorial and county school fund.	District tax.	Sale of bonds.	Other sources.	Total Receipts.
Beaver	\$394. 18	\$2, 982. 01	\$4, 877. 78			\$8, 253. 97
Blaine	191. 62	2, 510. 21	4, 788. 96		\$37. 12	7, 527. 91
Canadian						
Cleveland	4, 751. 13	10, 206. 32	15, 320. 74			30, 278. 19
Custer ^a						
D	495. 12	808. 00	1, 405. 73		32. 60	2, 741. 45
Day		179. 01	1, 061. 69		15. 00	1, 255. 70
Garfield	305. 45	6, 238. 90	19, 287. 18		452. 20	26, 283. 73
Grant ^b						
Greer		2, 425. 04	3, 716. 08		158. 23	6, 299. 30
Key	910. 13	4, 055. 83	5, 333. 07	\$505. 00	1, 506. 63	12, 400. 66
Kingfisher	3, 152. 39	6, 893. 09	19, 374. 70	52. 98	1, 314. 65	30, 786. 76
Lincoln	1, 319. 99	6, 594. 83	18, 243. 58	998. 00	2, 347. 43	29, 503. 83
Logan	12, 503. 01	11, 590. 60	27, 488. 23	2, 965. 00		54, 536. 84
Noble	971. 92	5, 940. 44	7, 808. 34		981. 10	15, 701. 80
Oklahoma	2, 473. 78	9, 087. 52	29, 228. 84	1, 040. 00	224. 15	42, 054. 29
Pawnee ^b						
Payne	2, 448. 51	6, 511. 61	11, 744. 69	8, 418. 36	668. 12	29, 789. 29
Pottawatomie	5, 025. 67	6, 566. 33	8, 758. 65	300. 00	3, 733. 38	24, 384. 03
Roger Mills	568. 08	553. 31	1, 489. 57		80. 00	3, 054. 11
Washita	231. 66	2, 313. 68	4, 195. 76		121. 95	6, 863. 05
Woods	2, 733. 25	10, 436. 93	12, 328. 73		7, 020. 95	32, 519. 86
Woodward ^b						
Total	38, 475. 89	95, 256. 81	196, 452. 27	4, 329. 29	18, 738. 41	364, 292. 77

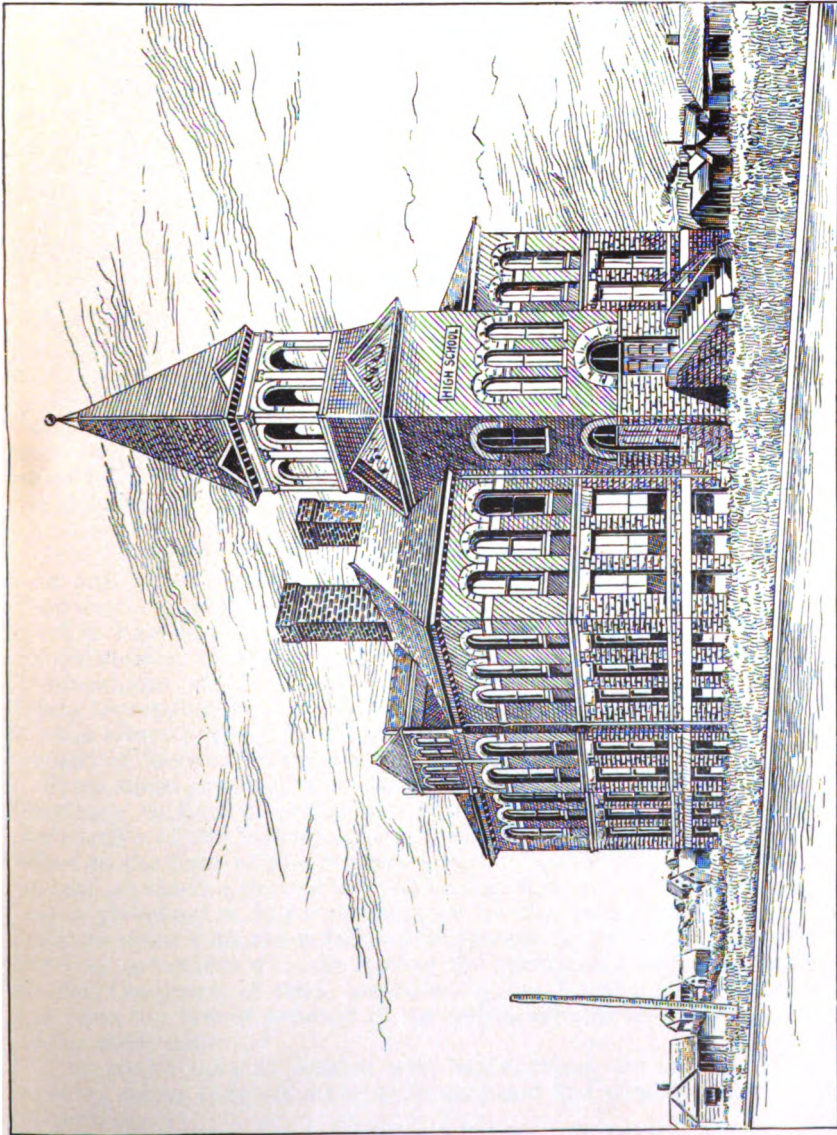
^a Records destroyed by fire.^b No report.*Expenditures for the year.*

County.	Teachers' salaries.	Site, buildings, and furniture.	Rents, repairing, and other incidentals.	Library and apparatus.	Other purposes.	Total.
Beaver	\$5, 900. 43	\$520. 63	\$375. 09	\$35. 15	\$288. 34	\$7, 119. 64
Blaine	6, 007. 65	158. 01	561. 96	30. 61	570. 88	7, 329. 10
Canadian						
Cleveland	18, 058. 05	447. 11	2, 041. 22	659. 74	561. 20	21, 767. 32
Custer ^a						
D	2, 408. 58	22. 30	134. 24		. 10	2, 565. 22
Day						
Garfield	8, 352. 38	3, 483. 33	1, 973. 06	121. 95	1, 095. 82	15, 028. 54
Grant ^b						
Greer	4, 664. 89	50. 15	557. 38		55. 95	5, 328. 27
Key	11, 225. 07	12, 799. 14	3, 404. 10	343. 50	1, 021. 75	28, 793. 56
Kingfisher	19, 562. 97	840. 45	3, 791. 38	818. 89	2, 574. 98	27, 588. 67
Lincoln	15, 058. 77	2, 409. 73	2, 160. 25	267. 67	2, 632. 88	22, 539. 30
Logan	26, 748. 28	5, 755. 00	5, 260. 00	1, 829. 15	6, 098. 28	45, 690. 71
Noble	8, 041. 97	2, 493. 47	1, 358. 80	169. 96	658. 31	12, 728. 51
Oklahoma	24, 680. 35	2, 073. 47	3, 710. 60	576. 73	11, 415. 79	42, 456. 94
Pawnee ^b						
Payne	15, 744. 62	10, 984. 56	2, 852. 86	590. 74	885. 18	31, 057. 96
Pottawatomie	10, 783. 33	1, 001. 40	1, 275. 66	242. 02	8, 669. 29	21, 971. 70
Roger Mills	1, 936. 55		38. 77		144. 66	2, 119. 98
Washita	5, 034. 00	81. 05	167. 07	915. 60	439. 51	6, 607. 23
Woods	22, 649. 45	4, 676. 34	2, 642. 32	307. 67	1, 719. 45	31, 995. 23
Woodward ^b						
Total	206, 857. 34	47, 812. 14	32, 333. 75	6, 909. 88	588, 832. 24	382, 740. 85

^a Records destroyed by fire.^b No report.

HIGHER INSTITUTIONS OF LEARNING.

No community on earth ever took so early a stand for higher education or made so rapid progress in an educational way as has Oklahoma. The first public institutions located in the Territory were institutions of



PERRY HIGH SCHOOL.

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learning, the first public buildings erected were colleges, and the first and only bonded indebtedness of the Territory was incurred for the erection of these colleges. Other Territories of the Union have been content generally to wait for statehood before establishing colleges and universities; but Oklahoma had the youth to educate and rose to the emergency at once. Before the Territory was a year old a university, a normal school, and an agricultural and mechanical college were ready to receive students; and these institutions have grown and expanded and others been added to their number, until to-day Oklahoma is probably better provided with higher institutions of learning than any similar number of people, and has permanently established a system of public education, with all the modern and requisite appliances, more complete than exists in some of the oldest States of the Union. Every Oklahoman is proud of these institutions, and they are liberally patronized. Excellent work is being done in each one, and the attendance is increasing rapidly each year.

TERRITORIAL UNIVERSITY.

The university is located in Norman, the county seat of Cleveland County, a growing town of 3,000 inhabitants. It is beautifully located, on high ground. Its citizens are intelligent, enterprising people, who are in hearty sympathy with educational progress. The building is a fine one. It is built of stone and pressed brick; contains 21 recitation and reception rooms and a large chapel. It is located on a fine campus, 40 acres in extent, lying at a good elevation, overlooking the surrounding country. The campus and approaching boulevard have been planted in trees.

The University of Oklahoma is supported by a general tax of one-half mill upon each dollar of valuation on the assessment roll of the Territory. In addition to this support, section 13 in each township in what is known as the Cherokee Outlet was reserved from settlement for university, normal school, and agricultural college purposes in the proclamation of the President of the United States opening those lands to settlement. The lands so reserved have been appropriated for the above purpose by act of Congress, and have been leased for the benefit of the institutions named.

From these statements it will be seen that it is the purpose of the Territory to furnish practically free to her young men and women instruction of the highest order. This conception will be carried into effect to the limit of the resources of the institution. Believing it to be just as much a part of the public-school system of the Territory as any high school in any community, it is the purpose of the management to unite with the public-school system of the Territory in making its work articulate with the work of the graded and elementary schools, so that the course of study provided by the Territory may be continuous from the lowest primary in the public schools to the highest class in the university.

Any young man or woman who has finished the course in a good country school may enter the university and find educational work and a welcome.

The work of the university has been characterized by absolute harmony between all the members of the faculty and the students of the university, and no interruption or unpleasant frictions have occurred from any source to interrupt the work of the institution.

All the members of the faculty have been active, prompt, energetic, and for the most part constant in their devotion to their work. One of

the most gratifying features of the year has been a manifestation on the part of each member of the faculty of a responsibility for the development of his part of the university.

During the year there have been 359 different students enrolled.

These students are the children of parents of twenty four different professions or occupations, come from twenty different counties and seven other States, and are adherents of seventeen different churches.

The college department, which must in time be the great part of the university, has made decided advancement the past year, and for the first time the full four-years course was offered, and two students were graduated. In the preparatory, pharmacy, and music departments excellent work was done. The prospects for the future of the university are very high indeed. A department of biology has been added and another professor engaged, making the faculty one of great proficiency.

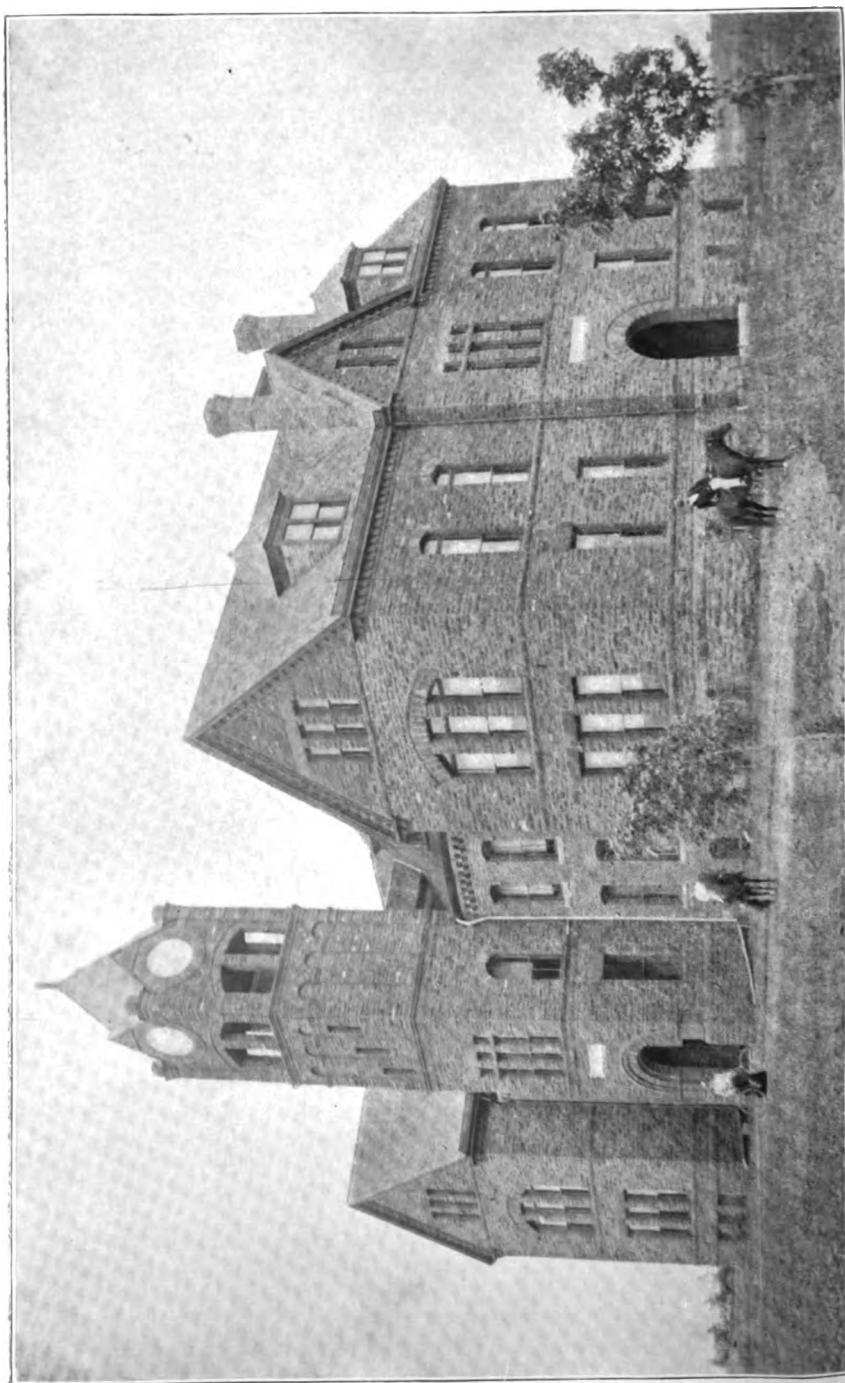
Many additions are being made to the library, the apparatus, and entire college equipments, and the grounds being beautified by walks, drives, etc.

A summer term of the university is being held this summer, with an attendance of nearly two hundred, and the prospects are good for a greatly increased attendance the coming year.

AGRICULTURAL AND MECHANICAL COLLEGE.

The Agricultural and Mechanical College at Stillwater is made by law especially a "college for the people," receiving students direct from the common schools, and being required to specially adapt its instruction in all branches to their applications in the industries of life. It is endowed by the United States Government, receiving \$23,000 last year. It also receives a portion of the rentals of leased lands in the "Cherokee Strip." As in all the institutions for higher education, instruction is free, except a nominal incidental fee. The past year was the most successful in the history of the college, 170 students being in attendance, 70 of these in regular college classes. A third class of 8 members was graduated after a four-years course. The chief lines of study are the sciences, with their applications, English, and mathematics. A suitable building for use of the mechanic-arts department is being erected. With the opening of the new college year, September 12, regular courses in civil and mechanical engineering will be established, also a commercial, a stenography and typewriting, and a musical department will be opened. The college will have 15 professors and instructors, including 2 in the preparatory department, maintained for those desiring review in common-school studies, in preparation for teaching or entrance into the college classes. The college has a good but overcrowded building, well-arranged laboratories, over \$20,000 worth of apparatus, and a library of about 4,500 volumes.

The Oklahoma Agricultural Experiment Station, supported by the United States, which gives it \$15,000 per year, is a department of the college. It occupies the larger part of the college farm of 200 acres, and has convenient but too small buildings for its scientific and practical work. Chief lines of investigation are study of soils, especially as to their relations to water as influenced by cultivation, manuring, and different crops; tests of varieties and methods of culture of field, orchard, and garden crops; feeding and breeding experiments with cattle, swine, and poultry. Experiments in irrigation had been prepared for, but the abundant rains made this impracticable. Aside from tests of



OKLAHOMA NORMAL SCHOOL AT EDMOND.

many varieties of wheat, corn, kaffir, cotton, grasses and other forage plants, sugar beets, etc., the station has large orchards and fruit gardens. There is a marked increase in interest in the work of the station by citizens of the Territory, shown by a multitude of requests for information and for the bulletins reporting results of experiments, sent free to all applicants.

OKLAHOMA NORMAL SCHOOL.

In keeping with its determination to have the very best school system to be had, Oklahoma declared early for the special education and training of her teachers in normal schools. The Oklahoma Normal School was located by the first legislature at Edmond, a beautiful little city on the Santa Fe Railway, and the next year a brick and stone building was erected on a finely located campus, which has since been added to until it is one of the imposing educational structures of the West.

This institution has been successfully conducted from the start, and is now in a most flourishing condition, reflecting credit upon the management and the faculty.

Last year its students numbered 251, a gain over the previous year of nearly 46 per cent. This is exclusive of the pupils in the model school, a department opened for the first time in the fall of 1897.

In the past year several thousand dollars were judiciously expended in completing the north wing of the building and fitting up laboratories for the development of natural and physical science. Large additions were made also to the library, and valuable mathematical instruments bought. Water pipes have been run over the grounds and through the building.

The faculty, consisting of a president and 9 assistants, is thoroughly organized, and it is believed that the future of this school will be a source of pride to our Territory.

It is expected that in the coming year the board of education will put gas into the building, greatly strengthen the model department, and largely increase the library facilities.

At this writing there is every prospect of an increased attendance, a fact which attests more strongly than words the high standing of the school and the interest our people feel in its welfare. Educational expansion seems to be a principle with them.

Edmond and Alva (standing as one), with their normals, are earnestly cooperating to solve our educational problems.

NORTHWESTERN NORMAL SCHOOL.

It did not seem at the time of the location of the Northwestern Normal School at Alva that there was need for such an institution in that part of the Territory; but a careful investigation will readily convince the most skeptical that the institution was needed, and it would have been an injustice to hundreds of teachers and aspiring young people to longer deny them an accessible institution of learning. There are in Woods County alone 226 school districts demanding competent and progressive teachers, and three times that many districts in other western counties, so located that it is out of the question for the teachers to attend a normal school in eastern Oklahoma.

The attendance at the normal during its first year, when the sessions were held in a church and many disadvantages constantly present, reached 168, and the prospects are that when the new building is completed the coming winter the attendance will be more than double. The

teaching force is excellent and will be added to as the needs of the school require. The students are earnest and energetic, and have all done good work. There are 9 married students in the school, and the oldest student is 42 and the youngest 11 years, the average age in the normal department being 18 years 5 months, and in the preparatory department 14 years 10 months.

In February the board of education, with the approval of the governor, let the contract for the building for this school, a handsome and substantial structure of cut stone and pressed brick, to cost, when completed, \$85,000. It will be a credit to the Territory and a structure in keeping with the educational needs of this coming great State. Ground was broken March 26, 1898, and on July 1 the foundation was complete and the first floor laid. Work will be pushed from this on, and the structure will be completed by the close of the year.

COLORED AGRICULTURAL AND NORMAL UNIVERSITY.

Work has been vigorously pushed on the new Territorial Colored Agricultural and Normal University, provided for by an act of the last legislature.

The people of Langston, Logan County, the only exclusively colored city in the United States, donated 40 acres of ground for a site, and last winter the board of regents adopted plans and specifications for a building to cost about \$5,000, to be a substantial stone building with basement and four rooms two stories high.

The corner stone was laid April 7 with appropriate ceremony. Many visitors were present from abroad, both white and colored. Excellent addresses were made and the Masonic Order laid the stone. This building is now nearing completion and is expected to be ready for occupancy by September 14. It will be a credit to the Territory, while the expense of building has been very reasonable. In anticipation of the school to be opened, a president and members of the faculty have been chosen from among the leading colored educators in the land.

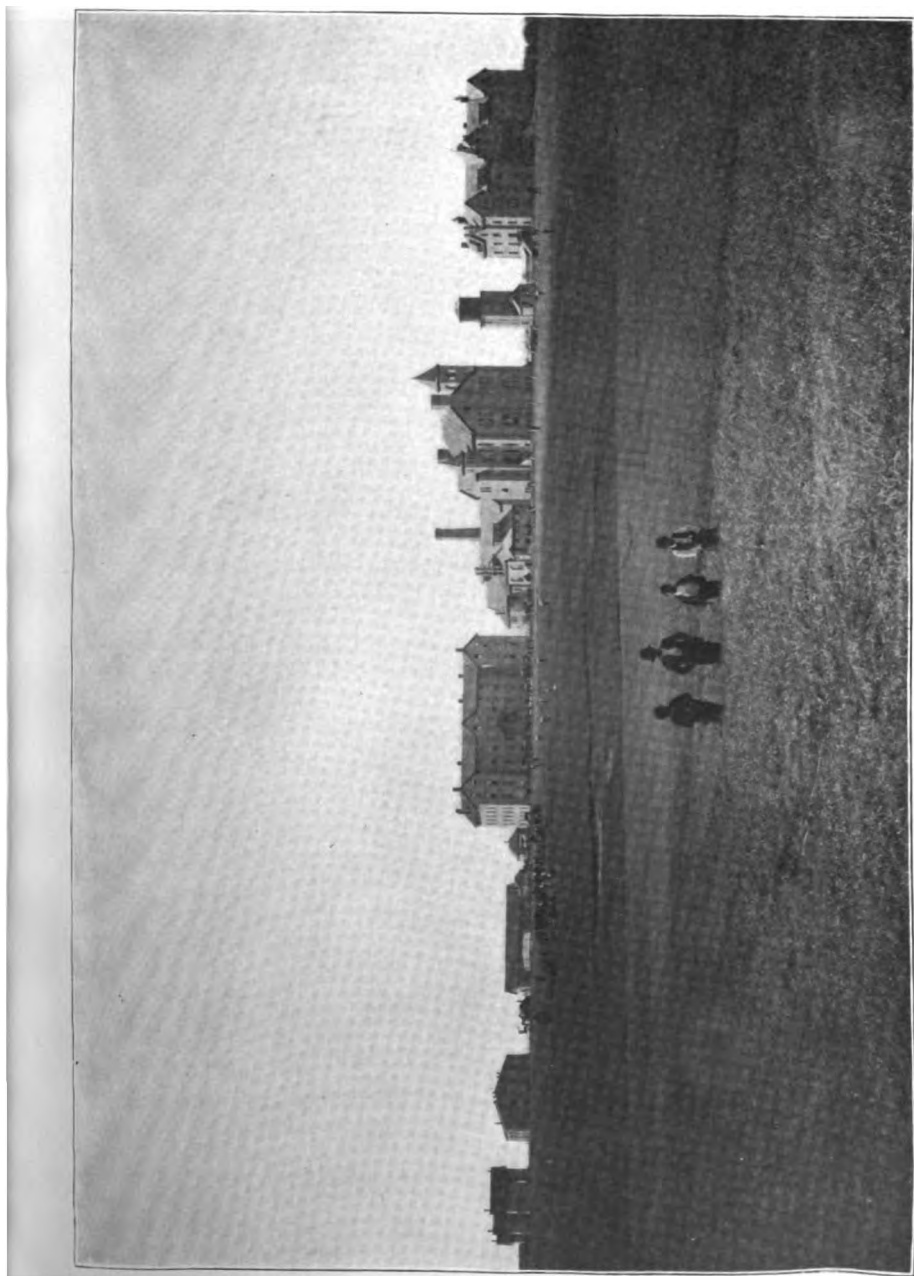
The course of study will include all the regular college branches of science, mathematics, and languages, as well as music, vocal and instrumental, drawing, etc., and later it is hoped to add practical and normal training in various lines of work.

A matron has been selected for the girls also, and there will be provisions for homes for all students.

The outlook for a large attendance this first year seems good, as the colored people through the Territory exhibit a lively interest in their own school. The time set for the dedication of the new building is September 22, when public exercises of an interesting character will be held.

CHILOCCO INDIAN SCHOOL.

Foremost among the educational institutions in the Territory is the Chilocco Indian School (once named Hawarth Institute), located in Kay County, 5 miles south of Arkansas City, Kans. Located upon a reservation of 6,000 acres, this institution is almost a little city in itself, with its large college building, girls' and boys' dormitory, hospital, chapel, workshops, laundry, electric light and waterworks plant, residences, storehouses, granaries, and barns, surrounded by bearing orchards, waving fields of grain, or tempting gardens—all the property of the school. When the school was first established, it was the intention to cut the reservation into small farms and locate thereon the



CHILCOCCO INDIAN TRAINING SCHOOL.



graduates of the school, away from the tribal reservations and their consequent degenerating influences. This policy was long since abandoned, but the boys and girls, young men and young women, gathered here from all the different tribes of Oklahoma and Indian Territory, as well as from many of the other tribes of the West, are given a fair education, not only in the ordinary school and college branches, but in farming, the trades, and domestic work of various kinds, so that they leave the school fitted to cope with life in all its phases and to compete fully with their white brothers and sisters. This school is most excellently managed in every department, and the progress being made by the scholars is truly remarkable. Over 500 pupils were in attendance the past year, and in the manual training departments, in shops, laundry, and household, are made the clothing and shoes of the scholars, while the farm is made very profitable by the labor of the scholars learning the art of the successful tilling of the soil. In the school are literary and debating societies that compare favorably with those of any white college, the largest active Christian Endeavor society and Sunday school in the Territory, and the commencement exercises this year were of a high order and of deep interest to the hundreds of white visitors.

OTHER INDIAN SCHOOLS.

There are a number of other Indian schools in the Territory. The Osage tribe has as fine an equipped school building at Pawhuska as can be found anywhere in the country. At Darlington is a finely equipped and managed school for the Cheyennes and Arapahoes, while there are also large and well conducted schools at White Eagle, Sac and Fox, Shawneetown, Seger, Anadarko, Rainy Mountain, and other points, in which all the Indian children of the various tribes are being trained and educated and the advancement of the race insured.

OTHER SCHOOLS AND COLLEGES.

There are a number of sectarian and other schools in the Territory. The Catholics have several large schools in the Osage reservation, a college at Sacred Heart, and one at Guthrie. The Congregationalists have an academy at Perry and a college at Kingfisher, where they are erecting a fine building.

The Friends have an academy at Stella, Woods County, and schools at several other places.

The Methodists have arranged to erect a hall in connection with the Territorial University at Norman, and there are good business colleges at Guthrie and Oklahoma City.

SOCIAL AND RELIGIOUS.

From a social and religious standpoint Oklahoma will compare favorably with any of the old settled States. A people who hold religious services in every town before it is a week old; organize fraternal societies in the rush and hurry of putting up tents and other temporary shelter; erect churches and schoolhouses among the first permanent structures in a community; locate colleges and universities before they do capitols, penitentiary, or asylums, and issue their first bonds to erect higher institutions of learning, need nothing further to prove their educational worth, moral and religious standing. All of the leading religious denominations are represented in the Territory, and every town has handsome and commodious church structures. In fact, some

of our towns have really more church buildings and church organizations than are needed, and it would be well if some of the surplus energy was transferred to the remote country districts. All of the denominations report rapid growth of their work the past year. In the early days of the Territory's existence, her Christian Endeavor Union carried off the national banner for most rapid growth of the work, and at the last International Sunday-School Convention at Boston, Oklahoma ranked first as having made the greatest per cent of increase of any State or province in America for the three years preceding. In not only the church edifices but in almost every one of the 1,600 country schoolhouses of the Territory is the Gospel preached and the Bible studied.

In a social way our people meet, as do those of any community, in the various private and public gatherings and functions of society, equal in every way to similar gatherings in the staid and conservative East. The towns have the drama, literary societies, lecture courses, reading circles, music clubs; the country, horticultural and agricultural and other societies, while the leading beneficiary and fraternal orders are well represented in all parts of the Territory. There are in the Territory a dozen or more active women's clubs, who within the past year organized a Territorial federation and sent a large delegation to take an active part in the recent national federation meeting at Denver.

I give below the statistics of the leading churches and fraternal organizations:

Presbyterian Church.

Church organizations	43
Church membership	1, 450
Church buildings	28
Value of church property	\$45, 550
Colored churches	2
Young people's societies Christian Endeavor	20
Sunday schools	47
Preachers	29
Sunday school missionaries	4

Episcopal Church.

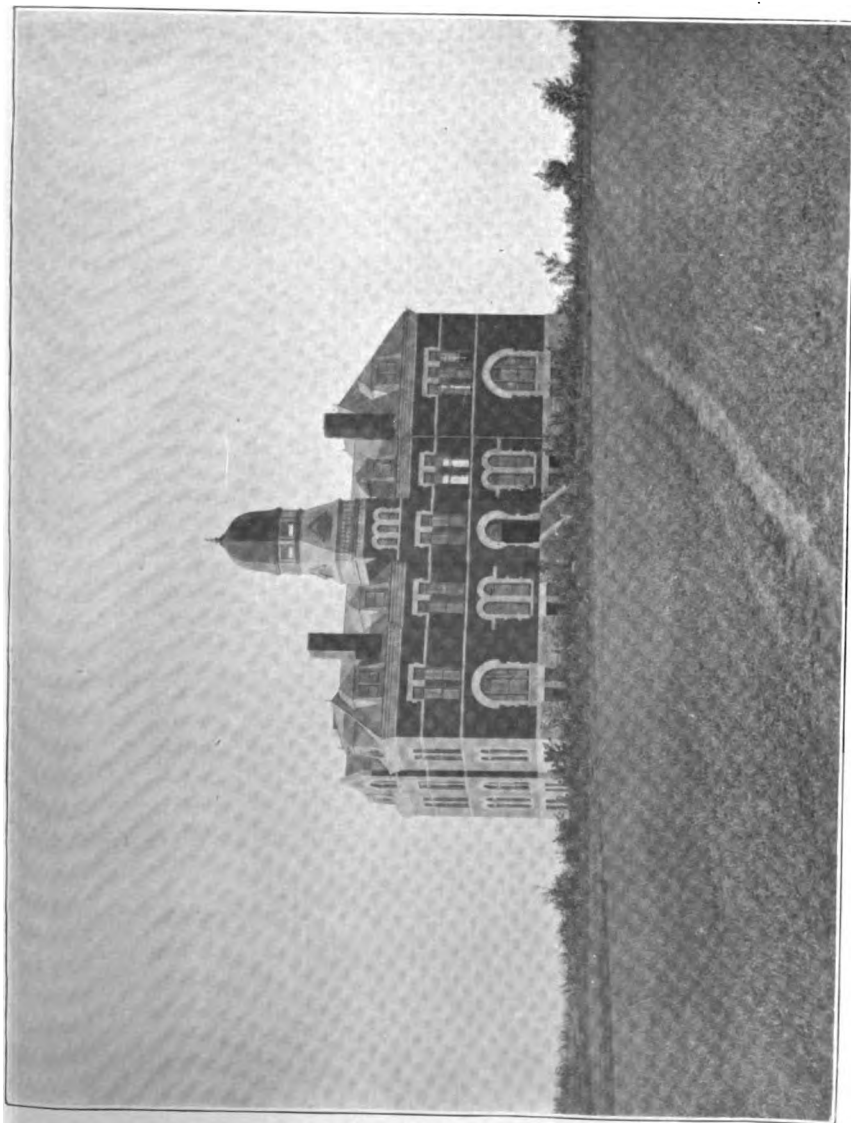
Organized missions	14
Other regular stations	14
Church buildings	11
Parsonages	7
Clergy	7
Communicants	380
Value of church property	\$21, 000
Chapters St. Andrew's Brotherhood	1
Daughters of the King	1
Children in Sunday school	130

Baptist Church.

Churches:	
White	185
Colored	85
Membership:	
White	5, 388
Colored	3, 600
Ministers:	
White	80
Colored	100
Membership, Sunday school	8, 000

Methodist Episcopal Church.

Number of churches	78
Value of churches	\$75, 000
Parsonages	30
Value of parsonages	\$15, 000
Members	5, 000



TERRITORIAL UNIVERSITY AT NORMAN.

Friends Church.

Total white membership	900
Indian members	200
Indian missions	5
Indian school	1

Congregational Church.

Organizations	90
Membership	2, 500
Church buildings	60
Value of church property	\$50, 000
Preachers	49
Colored church	1
Young people's societies of Christian Endeavor	28
Membership of societies of Christian Endeavor	928
Sunday schools	96
Membership	4, 512
Grants to build churches since 1889	\$22, 000
Expended by Home Missionary Society	\$70, 000

Roman Catholic Church.

Bishop	1
Priests	21
Churches	28
Chapels	6
Stations visited	80
Membership	11, 000
New residences for priests	6
Academies	4
College for boys	1
Schools for boys and girls	4
Schools for colored	3
Convents	4
Monastery	1
Value of school and church property	\$80, 000

Methodist Episcopal Church South.

Pastors	26
Assistant pastors	2
Local preachers	27
Pastoral charges	26
Societies or churches	88
Members (Indians 95, white 3,189)	3, 284
Church buildings	22
Value of churches	\$29, 975
Number of parsonages	14
Value of parsonages	\$6, 000
Number of Sunday schools	49
Number of officers, teachers, and scholars	2, 054

Christian Church.

Number of organizations	86
Membership	6, 000
Church buildings	19
Value of buildings	\$30, 000
Preachers	55
Colored preachers	2
Colored churches	3
Young People's Society of Christian Endeavor organizations	25
Sunday schools	35
C. W. B. M. organizations	7

Sunday schools.

Schools	1, 000
Officers and teachers	6, 000
Scholars	40, 000
Per cent of population attending Sunday school	15
Per cent of children attending Sunday school	30

Young People's Societies of Christian Endeavor.

Societies.....	163
Members.....	5,660
Junior societies.....	22
Members.....	840
Total membership.....	6,500
New societies.....	30
Associate members uniting with church during year.....	275

Fraternal organizations.

Name.	Number of members.	New members.	Number of organizations.	Value of property.	New Lodges.
Ancient Order of United Workmen.....	1,400	400	34		4
Knights of Pythias.....	1,002	182	23	\$10,000	3
Odd Fellows.....	2,395	250	64	3,200	12
Woodmen of the World.....	500		20		
Grand Army of the Republic.....	1,500	200	56	900	2
Confederate Veterans.....	250		5		
Maccabees.....			2		
Eastern Star.....			20		
Sons of Herman.....			10		
Masons.....	1,458		34		

DEAF MUTE INSTITUTE.

October 1, 1897, in accordance with the provisions of the act of March 12, 1897, levying a special tax for the care and education of deaf mutes and authorizing the governor to contract for same, I made a contract with H. C. Beamer, of Guthrie, to establish the deaf mute institute.

The institute was located in West Guthrie, in a large two-story frame building, pleasantly situated on the banks of the Cottonwood River, the premises embracing an entire block, giving ample play and exercise grounds for the pupils.

The formal opening was made on January 1, 1898, and 22 pupils have been admitted, apportioned among the counties as follows:

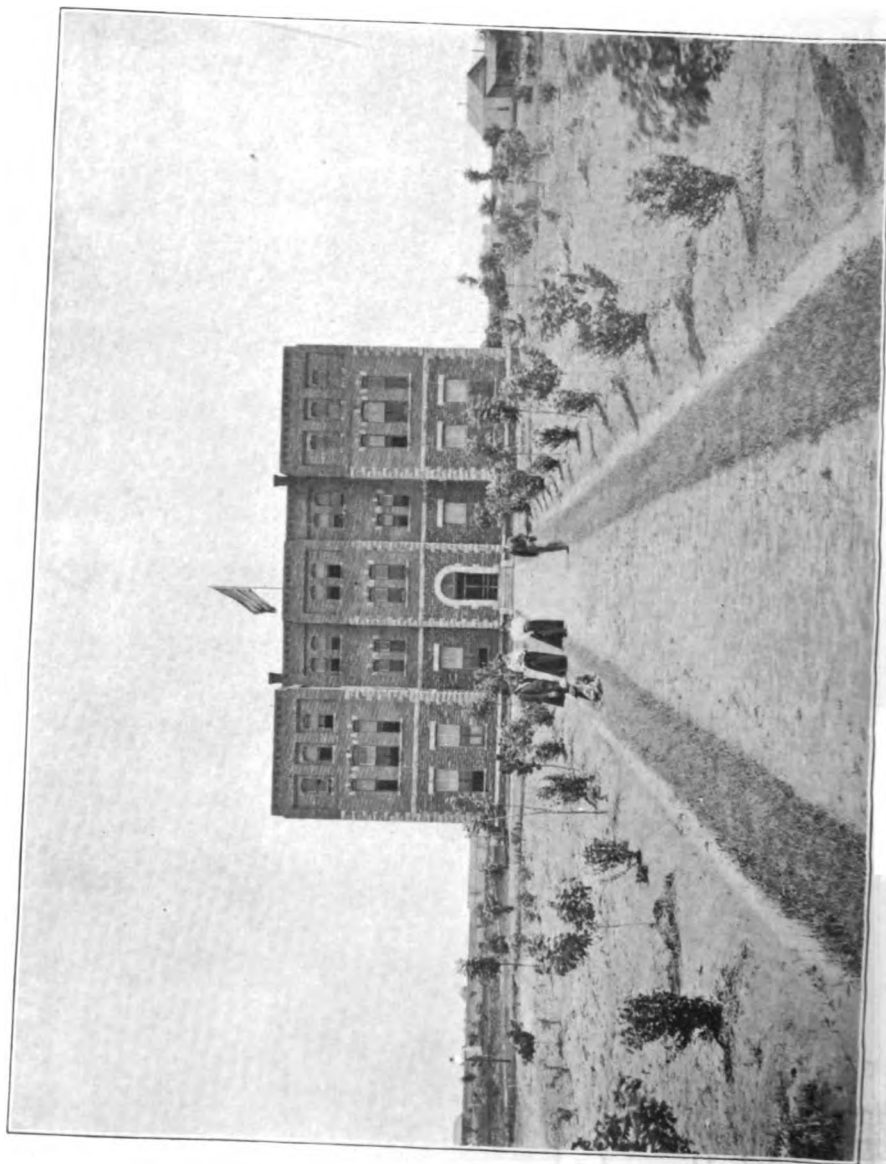
Canadian.....	3
Lincoln.....	1
Logan.....	3
Noble.....	2
Oklahoma.....	3
Payne.....	3
Pottawatomie.....	2
Roger Mills.....	1
Washita.....	1
Woods.....	3

At this time there are on file 27 additional applications for admission which can not be entertained until the legislature makes further and adequate appropriation for their care. There are in the Territory between 60 and 70 deaf and dumb of school age and about 30 infants and adults.

The institute building has been arranged with special reference to the comfort and health of the inmates. It constitutes their domicile. There they eat, sleep, and resort for rest and recreation, and, so far as possible, its appointments and furnishings have been made with a view to contentment, good health, and the enjoyment of such conveniences and acquisitions as are usually found in well-ordered homes.

The superintendent and matron reside here with the pupils and have them in immediate charge and oversight.

A separate building adjacent to the premises is used as a schoolroom.



OKLAHOMA SANITARIUM BUILDING (INSANE ASYLUM) NORMAN.

The school is in charge of Miss Kate Lindsay, a capable teacher of the deaf and dumb, who has had seven years' experience in this special work. The school hours are the same as in the public schools of the Territory, but the pupils are required to study one hour each evening of the school days. On Sunday a Sabbath school is held and Bible study conducted in the mute language. This language is used in returning thanks at meals.

The pupils have made surprising progress in their school work, and it is a pleasure to record that moral development has kept pace with the intellectual, and the majority have learned and put into practice many of the virtues essential to the maintenance of good character, of which they were before ignorant or concerning which they were apparently indifferent.

THE BLIND.

The last legislature made an appropriation for the care and education of the blind of the Territory, but the amount of the appropriation was so small that it has been impracticable as yet to make any arrangements for the establishment of a school or asylum.

REFORM SCHOOL.

It seems desirable that Oklahoma should have a reform school for youthful criminals, for within the past few years a number of mere boys have been sent to the penitentiary, who, with the training to be secured in a proper reform institution, might become useful citizens.

The legislature has empowered me to contract with other States for the care of such youth; but having failed to make a specific appropriation it has been impossible to complete any arrangements.

INSANE ASYLUM.

Oklahoma's insane are cared for by contract with the Oklahoma Sanitarium Company, who have erected a large and commodious asylum or hospital of brick and stone near the city of Norman, in Cleveland County. The first contract, which had been made at the rate of \$300 per annum for each patient and run for three years, expired last spring, and I renewed the contract for a second term of three years at a reduction of 33½ per cent, the Territory now paying but \$200 per year for each patient. When the accommodations and care given the patients are considered it becomes apparent that this rate is about as low as the Territory could care for the insane in her own asylum had she one built.

This asylum is well conducted in every way, and the fact that private patients are being brought from other States and the United States has contracted with the company for the care of insane Indians speaks well for the management and conduct of the institution. The third annual report of the superintendent of the asylum shows that the institution has completed a most prosperous year, marked by extensive improvements in buildings and grounds and increased capacity and attendance.

Besides the addition of a large new laundry, two comfortable cottages, each capable of accommodating 50 patients, have been erected for the use of the epileptic and violent patients, thereby separating them from the other milder classes of patients, to the benefit of both. The trees, of which there are now several hundred on the grounds, are

in a flourishing condition. The lawn has been graded and nicely sodded and greatly improved by the addition of flowers and shrubbery.

The sewerage system has been enlarged to meet the requirements and thoroughly renovated, a complete private system of waterworks put in, and the entire institution renovated and improved.

The number of admissions for the past year has been considerably in excess of the number for the preceding year, and the number under treatment at the close of the year is greater than ever before. The health of the entire institution is remarkably good, attesting the fine sanitary condition and comfortable location of the institution.

The records show the number of patients under treatment during the year to have been 298. The death rate among these is $8\frac{1}{2}$ per cent. The percentage of cures is 25. Of the 196 patients now confined in the asylum there is only one case of illness, and this is a patient who was brought there from Pottawatomie County on the 10th of June, 1898, in a very feeble condition from consumption.

The following table shows the number of patients from each county, number received, discharged, etc.:

County.	Number of patients July 1, 1897.	Received in one year.	Deaths.	Releases.	Escapes.	Number on hand July 1, 1898.
Beaver.....		3		2		1
Blaine.....		2	1			1
Canadian.....	8	10	1	4		13
Cleveland.....	10	12	1	9		12
Custer.....		1				1
D.....		3		1		2
Day.....						
Garfield.....	13	3		5		11
Grant.....	1	6		1		6
Greer.....	1	5	1	1		4
Kay.....	6	12	3	3	2	10
Kingfisher.....	13	6		2		17
Lincoln.....	8	6		3		11
Logan.....	14	12	4	5		17
Noble.....	4	8	1	2	1	8
Oklahoma.....	26	21	5	12		30
Pawnee.....	2	1		2		1
Payne.....	13	14	5	7		15
Pottawatomie.....	11	17	2	8		18
Roger Mills.....	1			1		
Washita.....	4	5		3		6
Woods.....	4	8		2	1	9
Woodward.....	3	1	1			3
Total.....	142	156	25	73	4	198

During the year the Territory paid:

For care of the insane.....	\$58,265.79
For transportation of the insane.....	3,054.52
Total.....	61,320.31

Owing to the large increase in the number of patients, this is \$18,520.07 more than was paid in the preceding year, but under the new contract the greatly reduced price per patient will reduce the item of care over \$20,000 the coming year.

PUBLIC LANDS.

Notwithstanding the great rush of settlers at each successive opening of public lands, the subsequent rapid development of all parts of

the Territory and the great influx of population the last year or two there are still many thousands of acres of Government land in the Territory, a considerable portion of which will make good homes for the homeless people of the more populous sections of the country, where, by energy and industry, they can establish farms that will yield of grains, fruits, and vegetables enough for the support of a family and the making of provision for old age or the inevitable "rainy day," which in the western country proves to be in reality a dry season.

This land is to be acquired under the homestead laws by the settler filing on same at the land office, and then taking up his residence on the land and occupying and cultivating it for five years. In Greer and Beaver counties the settler gets his land free at the end of five years, his only cost being \$14 filing fees. In the other parts of the Territory the land costs him from one to two and a half dollars per acre.

From reports received from registers and receivers of the different United States land offices in the Territory I glean the number of acres of land in each district and the number still vacant, which is given below.

Guthrie land district.—No lands subject to entry.

Oklahoma land district.—There are 4,095,000 acres in this district, but 138,270 acres of which are yet open to settlement, as shown by the following table:

Statement of lands vacant, reserved, and segregated in the Oklahoma land district, July 1, 1898.

County.	Vacant.	Reserved.	Filed on.	Area in district.
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Blaine		55,000	10,000	65,000
Canadian		181,420	200,580	382,000
Cleveland		80,000	268,000	348,000
G (Custer)	9,000		237,000	326,000
I.		646,000		646,000
Lincoln		118,000	111,000	229,000
Oklahoma	3,270	36,720	308,010	348,000
Pottawatomie		273,500	227,100	501,000
Roger Mills	108,000	40,000	474,000	622,000
Washita	18,000	109,000	501,000	628,000
Total	138,270	1,620,040	2,336,690	4,095,000

Perry land district.

County.	Reserved.	Vacant.
	<i>Acres.</i>	<i>Acres.</i>
Key	46,579	
Noble	30,345	
Pawnee	30,949	2,153
Payne	10,842	

In closing, the register and receiver of that office say:

You will see from the above that there are no vacant lands in our district except in Pawnee County, and very little of that is of any value for anything except, perhaps, grazing land.

Kingfisher land district.—In this district there are over 1,000,000 acres subject to homestead entry. The prospective settler can find many

good locations for successful, paying farms and comfortable homes, and there is no place in the district where cattle raising is not profitable.

County.	Area unap- propriated.	Reserved.	Disposed of.	In the dis- trict.
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Blaine.....	17,880	237,040	273,080	528,000
Canadian.....	760	39,560	98,880	139,000
D.....	274,050	103,380	259,580	637,000
Day.....	587,260	38,400	40,340	666,000
Custer.....	91,264	51,520	178,216	321,000
Kingfisher.....	190	74,240	493,570	568,000
Logan.....		6,400	105,600	112,000
Oklahoma.....		1,280	21,720	23,000
Roger Mills.....	91,600	12,160	31,240	135,000
Total.....	1,063,004	563,760	1,502,236	2,128,000

Enid land district.—There is not an acre of land vacant in Garfield County and only 1,280 acres in Grant County, most of which is poor farming land.

County.	Vacant land.	Land re- served.	Appro- priated.	Total.
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Garfield.....		74,462	565,538	640,000
Grant.....	1,280	75,335	595,385	672,000

Alva land district.—The district embraces Woods County alone, and the report of the register and receiver shows:

	<i>Acres.</i>
Appropriated July 1, 1898.....	1,317,517
Unappropriated July 1, 1898.....	372,513
Reserved.....	41,970

Total in district (Woods County)..... 1,732,000

There are many excellent homesteads still vacant in this district, but they are being settled on very rapidly.

Woodward land district.

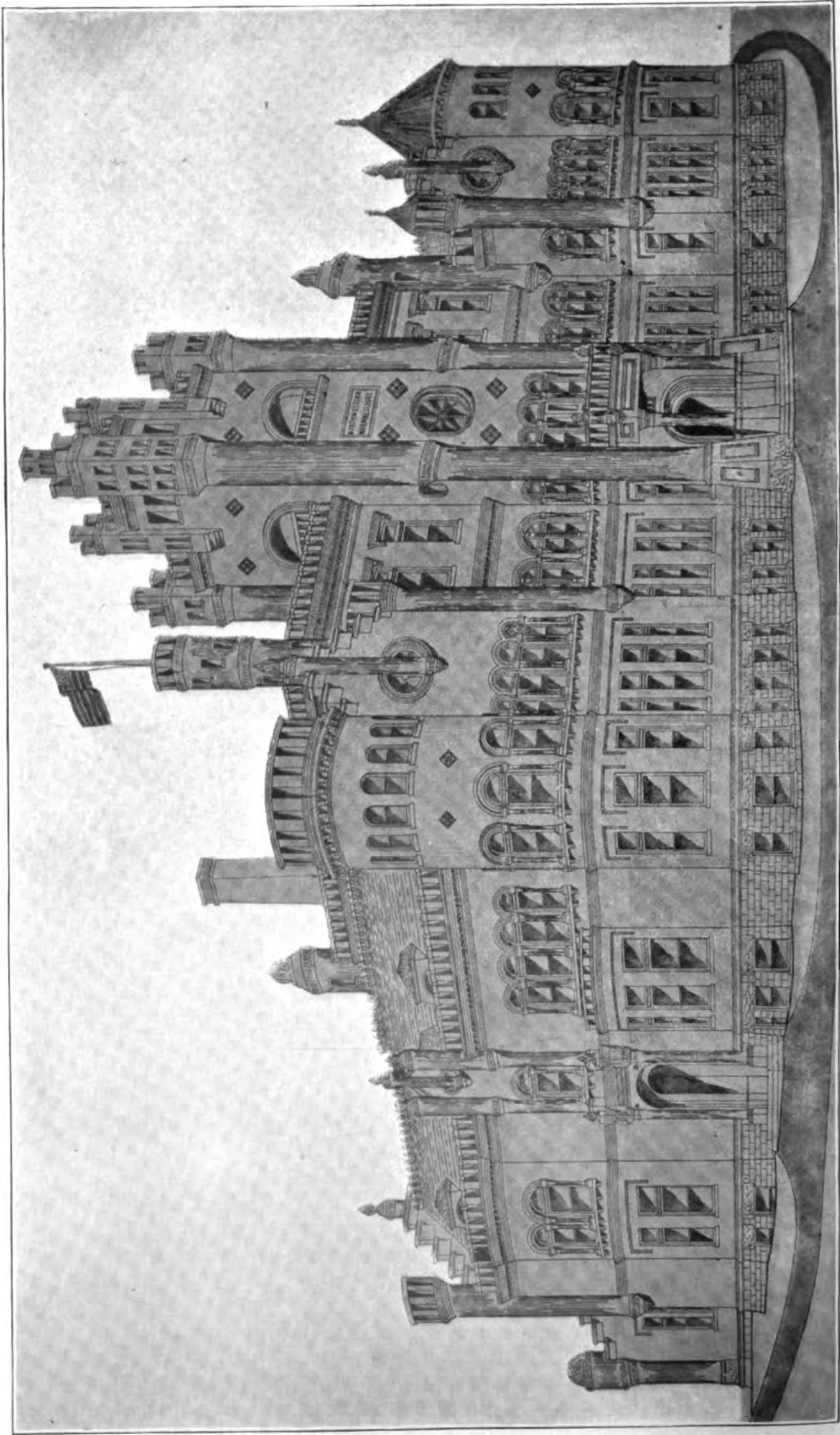
County.	Open for homestead entry.	Appropri- ated and reserved.	Total.
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Beaver.....	3,255,955	425,045	3,681,000
Woodward.....	1,506,238	617,762	2,124,000
Total.....	4,762,193	1,042,807	5,805,000

In furnishing the above statement the register and receiver say:

You will see from said statement that we still have 3,255,955 acres in Beaver County and 1,506,238 acres in Woodward County (total, 4,762,193 acres) of unappropriated lands that are subject to homestead entry.

We have had an abundance of rain this season, and the crop prospect was never better in any country, though we do not attempt to grow a general variety. Stock was never in better condition at this season of the year. In fact, western Oklahoma is on a boom. Land office business has increased wonderfully, and we are looking for many homeseekers as soon as harvest is over elsewhere.

While this district is largely devoted to stock raising, the farmers (who largely raise feed for stock) are all prosperous, for they have good



TERRITORIAL NORTHWESTERN NORMAL SCHOOL AT ALVA.

crops as a general thing, and have a market right at their door at good, profitable prices. Many settlers can still find good farm locations in this district, and the man who combines farming with stock raising has success assured.

Mangum land district.—This district embraces Greer County (in itself almost an empire), which was given to Oklahoma by a decision of the Supreme Court three years ago. The district embraces 1,511,575 acres of land, 843,798 of which had been taken up preceding July 1, 1898, leaving 667,777 acres subject to homestead entry at that time. The rush of immigration into this county is great, and the land is being taken up rapidly. It is an excellent farming and stock-raising county, and the people are generally prosperous. The register and receiver of the United States land office, in a report to me, say:

This county is enjoying a period of great prosperity. There has been plenty of rain for all crops the past two seasons; crops of corn, cotton, wheat, oats, vegetables, kaffir corn, and all kinds of feed crops are immense this year. There is a large immigration to the county this season, and the land is being rapidly taken up.

SETTLEMENT OF LANDS.

During the year settlers have taken up lands in the districts as follows:

	Acres.
Guthrie district.....	
Oklahoma City district	217, 400
Perry district.....	750
Kingfisher district	83, 252
Enid district	1, 820
Alva district.....	62, 041
Woodward district.....	75, 607
Mangum district.....	686, 596
Total	1, 127, 466

This makes 7,046 quarter sections settled upon during the year, and as there is generally a family on every quarter section it makes that number of new families settled in the Territory during the year. This is, however, but a small part of the immigration, as the greater portion of the newcomers leased school lands, bought farms, or settled in the towns. Still we have farms and homes for many thousands more.

SCHOOL LANDS.

By act of March 4, 1889, opening Oklahoma to settlement, sections 16 and 36 were reserved for the the use and benefit of common schools, and the reservation was confirmed by the organic act. The authority to lease these lands for a term not exceeding three years for the use and benefit of the common schools of the Territory, under rules and regulations prescribed by the Secretary of the Interior, was conferred upon the governor by act of March 3, 1891.

By authority conferred upon him in the act opening the Cherokee Strip to settlement, the President in his proclamation of August 19, 1898, not only reserved the regular school sections of 16 and 36, but also sections 13 and 33 in every township in what now constitutes Kay, Grant, Woods, Woodward, Garfield, Noble, and Pawnee counties, section 13 for the benefit of the colleges and university of the Territory and section 33 for public buildings.

By act of May 4, 1894, Congress turned the school lands over to the Territory and constituted the governor, secretary, and superintendent

of public instruction of the Territory a school-land board, to have full charge of the lands and lease same under the rules already prescribed by the Secretary of the Interior until such time as the Territorial legislature should prescribe other methods of caring for them. Up to this time the legislature has not been able to devise any better method.

The same act which created this school-land board also authorized them to lease sections 13 and 33, the proceeds of the former being divided semiannually among the educational institutions of the Territory and those of the latter going into a permanent public building fund. The act of June 19, 1897, creating Greer County as a part of Oklahoma, reserved sections 13 and 33 for such purposes as the future State of Oklahoma should prescribe, and the lands are now being leased and the proceeds kept in a separate fund subject to disposal by the State legislature when one shall have convened. It was not until January of this year that the preference right of old settlers in Greer County expired, but since then the school lands have been rapidly leased. Early in the year the secretary of the school-land board made a trip to Greer County and selected 48,585 acres of indemnity land in lieu of school lands taken by settlers, in allotments, lost by rivers, etc., the entire expense for this selection being \$226.85. During the year 3,185 acres of indemnity lands were selected in Custer County and 4,868 acres in D County at a very small expense to the Territory. The right to make such indemnity selections was conferred by act of Congress of February 28, 1891, and while the securing of these lands is a great boon to the public schools of the Territory, the selection of large bodies of adjacent lands is apt to work a hardship on the immediate locality, as in the case of the Kickapoo Reservation, where nearly all the land was so reserved and consequently is not subject to taxation.

As a result, the only means of raising money for erecting school-houses, constructing roads and bridges, and carrying on the schools is by personal taxes upon the lessees of the school lands. As they are mostly poor men, the amount raised is small, and it is with great difficulty that they are able to give their children the advantages of schools. The Territorial superintendent of public instruction is trying to devise some means of helping them. These settlers pay annually large sums into the school fund for the benefit of the schools of the Territory, and it does not seem right that they should be so restricted in their own school facilities.

There are now under the control of the school-land board about 10,800 quarter sections, about 8,500 of which are leased. East of range 14 west the lands are declared to be agricultural lands, and but one fourth section can be leased to one person. West of there they are declared grazing land, and a person can lease as many sections as he is willing to pay for. An arbitrary line dividing grazing from agricultural land is of course very misleading, as there are west of this line some as fine agricultural land as can be found, and east of it many quarters that are really only fit for grazing; but it was necessary to have a dividing line, and at the time this line was selected the country west was very thinly settled and not much farming carried on. Since then much of that country has been raising the finest of crops, and is filling up rapidly, though there are of course many large areas suitable only for grazing.

In grazing districts the school lands are leased in large bodies by the cattlemen, whose herds fatten upon the luxuriant grasses of these lands and the surrounding unentered Government land. In the agricultural district they are leased by settlers who failed to get Government land

or by late comers not able to buy farms. They are generally in a good state of cultivation, having more land broken and cultivated than the surrounding homesteads, and the improvements of a substantial kind. The reports of appraisers, sent out this year, show values of improvements on single quarters running as high as \$1,500 and \$1,800. Lessees desiring to renew their leases are given preference rights upon certain conditions, and are amply protected in their improvements. The constant flow of immigration the past year has caused an increased demand for school lands, and in several counties every quarter is leased at a profitable figure. There are, however, many quarter sections of good agricultural land still unleased, which will make very desirable homes for new settlers, and the system of transfer of leases enables persons to buy out lessees on excellent improved quarters, often with growing crops thereon, and secure comfortable homes on productive farms at a very low figure.

The school-land department has grown from a very small beginning, with one man doing everything, to the largest and most important department of the Territorial business. The records for the office show at this time the names of about 6,000 lessees; there are in the safes 11,086 notes for deferred payments, and in addition to the collection of rental, appraisalment, and transfer of lands and a correspondence of several hundred letters a day, the office force has in the past year made out and recorded 2,800 leases, a large proportion of which were for lands heretofore unleased, but which now make a handsome addition to the receipts of the office, which now aggregates well up toward \$200,000 per annum. During the year the cash receipts of the office were \$186,789.49; 1,354 quarter-sections heretofore vacant were leased, and \$165,293.70 in notes added to the various funds. Of the \$96,866.98 of past due rentals turned over by the preceding administration, \$49,534.76, or over 45 per cent, has been collected. A special agent has been sent out to investigate vacant lands, and already \$2,574.39 has been collected from parties who were using school lands without lease. The total expense of conducting the department during the year has been 6.8 per cent of the receipts, as compared with 8.3 per cent the year preceding, and 9.3 per cent in 1896.

I invite your attention to the following tables giving the status of the school-land funds and all details:

Receipts and expenditures for the year ending June 30, 1898.

On hand June 30, 1897.....	\$3,460.11	
Received from June 30, 1897, to June 30, 1898.....	186,789.49	
		\$190,249.60
Expenses for the year.....	12,719.71	
To treasurer.....	152,068.64	
Returned to applicants.....	626.95	
Balance on hand.....	24,834.30	
		190,249.60

Receipts and expenditures of each fund for the year ending June 30, 1898.

COMMON SCHOOL.

Cash received.....	\$134,182.67	
Expenses.....	\$8,816.14	
Returned to applicants.....	563.45	
Net proceeds.....	124,803.08	
		134,182.67

Receipts and expenditures of each fund for the year ending June 30, 1898—Continued.

COLLEGE.

Cash received.....		\$24,966.96
Expenses	\$1,851.03	
Returned to applicants.....	17.00	
Net proceeds.....	23,098.93	24,966.96

PUBLIC BUILDINGS.

Cash received.....		\$25,527.71
Expenses	\$1,842.92	
Returned to applicants.....	46.50	
Net proceeds.....	23,638.29	25,527.71

GREER COUNTY.

Section 13:		
Cash received.....		\$1,089.15
Expenses	\$104.81	
Net proceeds.....	984.34	1,089.15

Section 33:		
Cash received.....		1,023.00
Expenses	\$104.81	
Net proceeds.....	918.19	1,023.00

Net proceeds from leasing lands.

Fiscal year ending June 30—		
1891		\$4,536.82
1892		21,346.13
1893		19,164.67
1894		46,586.29
1895		88,627.97
1896		71,740.68
1897		98,467.81
1898		173,442.83
Total.....		523,912.20

School-fund apportionment to counties (\$1.34 per capita of school population).

Counties.	Children of school age.	Apportionment.		Total.
		January, 1898.	July, 1898.	
Beaver.....	909	\$954.45	\$263.61	\$1,218.06
Blaine	2,293	2,407.65	664.97	3,072.62
Canadian	4,270	4,483.50	1,238.30	5,721.80
Cleveland.....	5,278	5,541.90	1,530.62	7,072.52
Custer.....	1,804	1,894.20	523.16	2,417.36
D.....	1,033	1,084.65	299.57	1,384.22
Day.....	244	256.20	70.76	326.96
Garfield.....	4,904	5,149.20	1,422.16	6,571.36
Grant.....	4,455	4,677.75	1,291.95	5,969.70
Greer.....	2,513	2,638.65	728.77	3,367.42
Kay.....	4,983	5,232.15	1,445.07	6,677.22
Kingfisher.....	5,354	5,621.70	1,552.66	7,174.36
Lincoln.....	6,868	7,211.40	1,991.72	9,203.12
Logan.....	7,207	7,567.35	2,090.03	9,657.38
Noble.....	2,808	2,948.40	814.32	3,762.72
Oklahoma.....	6,495	6,819.75	1,883.55	8,703.30
Pawnee.....	3,260	3,423.00	945.40	4,368.40
Payne.....	5,564	5,842.20	1,613.56	7,455.76
Pottawatomie.....	7,886	8,280.30	2,286.94	10,567.24
Roger Mills.....	581	610.05	168.49	778.54
Washita.....	2,561	2,689.05	742.69	3,431.74
Woods.....	8,048	8,450.40	2,333.92	10,784.32
Woodward.....	1,267	1,330.25	367.43	1,697.68
Total.....	90,585	95,114.25	26,286.65	121,388.90

NOTE.—The net proceeds for July, 1897, \$3,252.71, was turned over to the Territorial treasurer and was apportioned by the board with money turned over to them for the year ending June 30, 1897. If apportioned with the receipts for the year ending June 30, 1898, as it should properly have been, it would have made the apportionment per capita nearly 4 cents greater.

Amount of distribution per capita each year.

Year ending June 30—

1892	\$0.83
1893	.56
1894	.72
1895	.69
1896	.62
1897	.86
1898	1.34

Notes on hand.

When due.	Number.	Amount.	When due.	Number.	Amount.
Common school:			College—Continued.		
Jan. 1, 1892	13	\$745.22	Dec. 15, 1900	2	\$99.00
Apr. 1, 1892	16	465.40	Oct. 1, 1901	8	264.00
Dec. 15, 1892	28	825.15	Dec. 15, 1901	2	99.00
Jan. 1, 1893	28	1,359.75	Oct. 1, 1902	2	66.00
Apr. 1, 1893	21	544.90	Total	1,562	56,302.94
Dec. 15, 1893	86	2,474.75			
Miscellaneous.	13	291.00	Public buildings:		
Jan. 1, 1894	34	1,665.75	Dec. 15, 1894	2	21.00
Apr. 1, 1894	18	551.40	Dec. 15, 1895	21	975.05
Dec. 15, 1894	34	9,042.67	Oct. 1, 1896	1	26.00
Oct. 1, 1895	23	543.26	Dec. 15, 1896	34	1,563.81
Dec. 15, 1895	306	14,441.87	Oct. 1, 1897	34	1,017.65
Oct. 1, 1896	97	2,383.89	Dec. 15, 1897	83	1,539.37
Dec. 15, 1896	211	11,432.62	Oct. 1, 1898	407	14,118.78
Oct. 1, 1897	517	15,180.83	Dec. 15, 1898	84	2,242.00
Dec. 15, 1897	33	2,159.37	Oct. 1, 1899	498	16,179.23
Oct. 1, 1898	2,344	81,297.41	Dec. 15, 1899	34	2,242.00
Dec. 15, 1898	56	6,226.75	Oct. 1, 1900	362	12,025.67
Oct. 1, 1899	2,684	87,407.83	Dec. 15, 1900	3	99.00
Dec. 15, 1899	51	6,031.75	Oct. 1, 1901	8	323.50
Oct. 1, 1900	1,011	28,656.76	Dec. 15, 1901	3	99.00
Dec. 15, 1900	2	133.00	Oct. 1, 1902	3	91.00
Oct. 1, 1901	88	2,781.37	Total	1,477	52,563.00
Dec. 15, 1901	2	132.00			
Oct. 1, 1902	20	570.00	Greer County, section 13:		
Total	7,935	277,344.70	Oct. 1, 1899	32	922.65
College:			Oct. 1, 1900	32	923.15
Dec. 15, 1894	4	175.00	Total	64	1,845.70
Dec. 15, 1895	18	779.00	Greer County, section 33:		
Dec. 15, 1896	27	1,115.02	Oct. 1, 1899	24	839.25
Oct. 1, 1896	8	75.00	Oct. 1, 1900	24	842.75
Oct. 1, 1897	23	495.75	Total	48	1,682.00
Dec. 15, 1897	21	994.32	Grand total		
Oct. 1, 1898	410	14,903.80		11,086	389,738.34
Dec. 15, 1898	28	2,309.00			
Oct. 1, 1899	550	18,138.55			
Dec. 15, 1899	28	2,309.00			
Oct. 1, 1900	436	14,480.50			

SALINE RESERVES.

There has been more or less agitation the past year looking toward the opening to settlement of the Saline reserves in Grant, Woods, and Woodward counties, in the northwestern part of the Territory. These lands are in three reservations aggregating about 100,000 acres, and at the opening of the Cherokee Strip to settlement were reserved from homestead entry because of the lands having been leased years before by the Cherokee Indians. It has since been discovered that this lease was never approved and hence is invalid.

The statutes of the United States require a special act of Congress to dispose of any real saline lands, and it has been the custom to donate them to the various States in which they are located. A large portion of these reservations are real saline lands, with salt springs and remarkable deposits of salt covering large areas; but there are parts which are not saline which make excellent pasturage, and still other parts good

agricultural lands. In view of the fact that much of the land sought to be donated to the Territory for colleges and public buildings has been lost by reason of fractional quarters, allotments, streams, etc., I would urge upon the Department and upon Congress the advisability of donating these saline reserves to the Territory for the benefit of the higher institutions of learning.

BANKS AND BANKING.

In the condition and business of the banks of the Territory is told a story of a year's prosperity unequalled anywhere in the United States. There are in the Territory 49 Territorial or State banks and 6 National banks, with an aggregate paid-up capital of \$789,786.69.

The Territorial banks are all under the jurisdiction of the Territorial banking board, subject to examination at any time by the Territorial bank examiner, and are compelled by law to make quarterly reports of their actual condition to all depositors. These regulations inspire confidence in the banks by the people, who patronize them generally. During the year 6 new banks have been started, 2 have consolidated, and 1 failed.

We give below a comparative statement showing the condition of the Territorial banks at stated periods during the year, also the per cent of reserve at each period, gain in cash, increase in loans, and per cent of gain in deposit.

Comparative statement of the Territorial banks in Oklahoma Territory.

RESOURCES.

	July 23, 1897.	Dec. 31, 1897.	Mar. 31, 1897.	June 30, 1898.
Loans and discounts.....	\$1,126,795.37	\$998,989.28	\$1,289,998.38	\$1,420,202.90
Warrants and bonds.....	100,573.68	78,587.78	103,090.89	78,888.74
Overdrafts.....	70,514.05	49,887.64	55,690.09	55,788.09
Cash and sight exchange.....	743,756.09	1,797,559.94	1,617,672.58	1,561,262.37
Real estate, furniture, and fixtures.....	202,398.80	191,897.59	176,533.36	150,784.96
Total.....	2,244,037.99	3,116,922.23	3,242,985.30	3,275,425.15

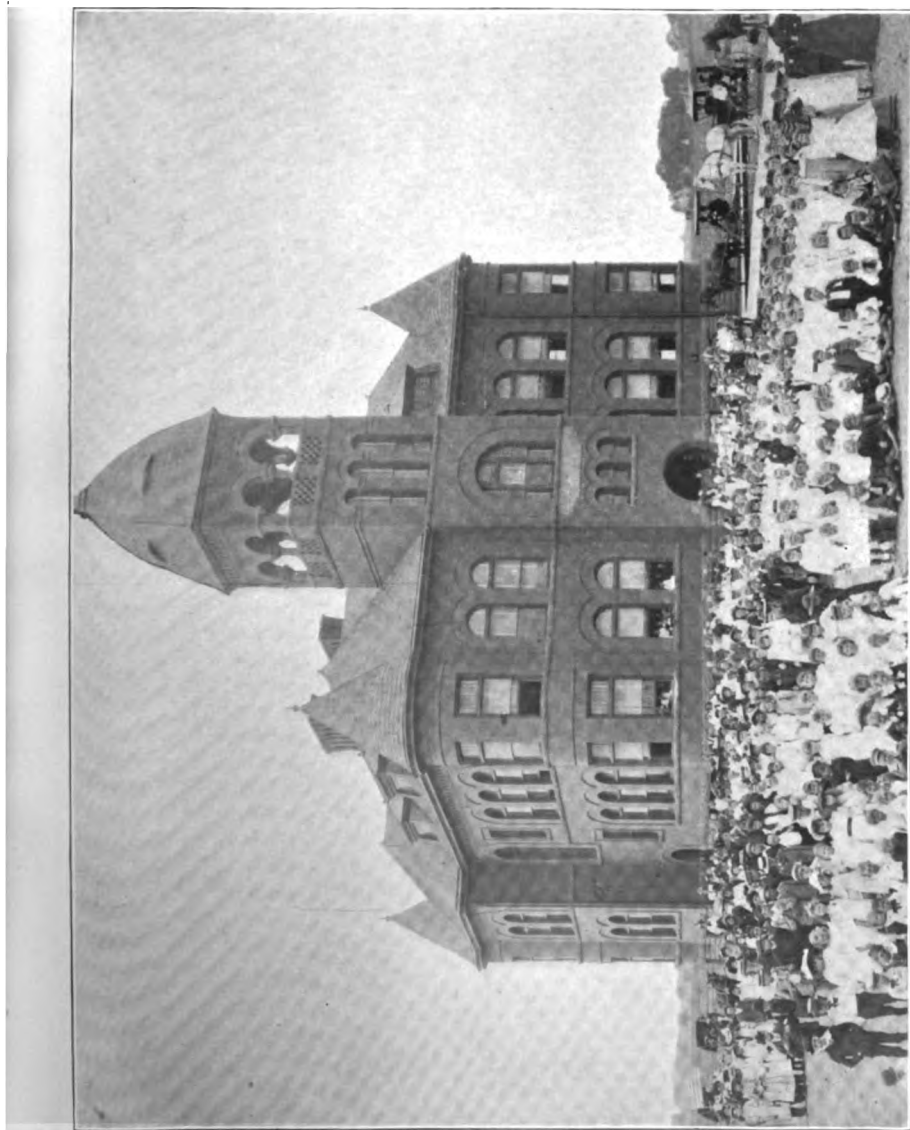
LIABILITIES.

Capital.....	\$613,328.70	\$565,578.83	\$492,320.00	\$509,790.00
Surplus and profits.....	115,621.36	146,154.64	188,316.40	205,153.28
Deposits.....	1,499,149.69	2,405,191.76	2,562,348.21	2,560,485.18
Rediscounts.....	15,938.24			
Total.....	2,244,037.99	3,116,922.23	3,244,985.30	3,275,425.15

COMPARATIVE.

Reserve.....per cent..	49	74	63	60
Gain in deposits.....		\$906,042.07	\$157,156.65	\$9,603.00
Gain in cash since July, 1897.....		645,417.32	873,916.49	827,506.26
Loans and discounts increased since July, 1897.....			163,203.01	293,407.63
Loans and discounts decreased since July, 1897.....		40,514.10		
Per cent gain in deposits since July, 1897.....per cent..		70	75	75

In addition to the banks under the control of the Territory, Oklahoma has 6 National banks. A report taken from their last report to the Comp-



WASHINGTON SCHOOL, OKLAHOMA CITY.

troller of the Currency follows. During the past year 1 National bank went into voluntary liquidation and 2 new ones have been established. No failures. The following is a statement of the National banks:

Resources:	
Loans and discounts	\$589,289.16
Overdrafts	15,308.18
United States bonds and premiums	77,375.00
Stocks and securities	68,757.75
Real estate, furniture, and fixtures	62,442.91
Cash and sight exchange	651,060.52
Total resources	1,464,233.52
Liabilities:	
Capital paid in	\$280,000.00
Surplus and profits	45,253.16
Circulation	67,490.00
Deposits	1,071,490.36
Total liabilities	1,464,233.52

This shows a gain of 50 per cent, or \$520,221, in the deposits of the national banks over their showing of a year ago. Their loans have increased \$320,039, or 125 per cent, and their cash holdings have increased 80 per cent, or \$252,312.

The figures for our banks herewith presented speak only of the past. The results of this year's crops are yet to be made up, and with their abundance, the prospects for good prices, and the present financial condition of the people, there is evident indication that the coming year will be one of greater prosperity to the banks than the present has been. Our banks have a larger reserve average at this time than those of any other State or Territory, and almost without exception have their affairs in excellent condition.

With a reserve four times as large as is required by law, I consider our banks in condition to meet any kind of emergency that may arise.

BUILDING AND LOAN ASSOCIATIONS.

There are three or four building and loan associations in the Territory which are doing a good business, and are important factors in building up the towns in which they are located and encouraging the people in habits of saving and economy. Their dividends average from 12 to 18 per cent per annum, compounded semiannually.

The Guthrie association, which is the oldest, has helped build over one hundred homes in that city; has now \$38,000 loaned to stockholders, and during the past year has paid \$10,000 of maturing stock to members, who thus accumulated considerable sums from small savings.

Many outside associations, attracted by the general prosperity of the people of Oklahoma, are coming into the Territory to get business, but it is to be hoped that every town of any size in the Territory will in the near future have an association of its own.

INSURANCE AND INVESTMENTS.

The territorial laws regulating insurance are ample, and afford full protection to the people against insecure and unreliable concerns. Before doing business in the Territory all insurance and indemnity companies must file with the secretary of the Territory, who is ex-officio insurance commissioner, a statement of their condition, and it is

discretionary with him as to whether or not they shall be licensed to do business in the Territory. If they are sound and all right he gives them a license, but still has the right to examine them at any time to revoke the license and shut them out of the Territory at any time on weakness or insecurity.

Each year every company is required to report to him full amount of business they have done in the Territory during the year and they are taxed on their gross earnings in each county in which they do business.

The reports of the companies licensed to do business in the Territory show the following business done during the year 1897:

Fire insurance.—January 1, 1898.

Name of company.	Location.	Insurance written in 1897.	Premiums received.	Losses paid.
Ætna	Hartford, Conn	\$289, 135	\$4, 460	\$908
American Central	St. Louis, Mo	181, 924	3, 203	1, 118
British American Assurance Co.	Toronto, Canada	48, 950	1, 352	475
Connecticut	Hartford, Conn	523, 912	8, 564	1, 359
Delaware	Philadelphia, Pa	102, 272	2, 719	443
German American	New York	365, 326	6, 688	3, 050
German Alliance a	do			
Hartford	Hartford, Conn	368, 917	6, 245	360
Fire Association of Philadelphia	Philadelphia, Pa	190, 297	5, 498	1, 262
Insurance Co. of North America	do	180, 906	4, 694	3, 278
London and Lancashire	Liverpool, England	209, 600	6, 487	718
Liverpool and London and Globe	do	806, 157	6, 708	1, 300
Niagara	New York	280, 000	4, 679	30
North British and Mercantile	London, England	34, 230	652	
Orient	Hartford, Conn	183, 760	3, 116	451
Providence Washington	Providence, R. I	116, 715	1, 429	50
Pennsylvania	Philadelphia, Pa	284, 964	4, 787	3, 910
Phoenix	Brooklyn, N. Y	560, 236	9, 535	3, 668
Royal	Liverpool, England	93, 606	1, 326	64
Shawnee a	Topeka, Kans.			
Springfield Fire and Marine	Springfield, Mass	797, 451	12, 865	3, 120
Scottish Union and National	Edinburgh, Scotland	142, 636	3, 988	947
Traders	Chicago, Ill	102, 225	2, 583	
Westchester	New York	148, 868	4, 442	1, 562
Western Assurance	Toronto, Canada	65, 074	1, 737	493
Merchants a	Newark, N. J			
Total		5, 567, 271	107, 697	28, 656

a Entered 1898.

Miscellaneous.—January 1, 1898.

Name of company.	Location.	Insurance written in 1897.	Premiums received.	Losses paid.
Fidelity and Causalty	New York	\$421, 621	\$1, 359	\$98
Lloyd's Plate Glass	do	4, 278	181	67
The Traveler	Hartford, Conn	14, 000	118	101
American Surety Co.	New York	9, 222	81	None.
Total		449, 121	1, 639	261

Life insurance.—January 1, 1898.

Name of company.	Location.	Insurance in force Dec. 31, 1896.	Insurance written in 1897.	Total insurance in force Dec. 31, 1897.	Premiums received in 1897.	Losses incurred in 1897.	Losses paid in 1897.
Connecticut Indemnity Association <i>a</i>	Waterbury, Conn.						
Covenant Mutual <i>a</i>	St. Louis, Mo.						
Equitable Life Assurance Society.	New York	\$155,193	\$94,450	\$211,143	(<i>c</i>)	\$167.00	\$167.00
Hartford <i>b</i>	Hartford, Conn.						
Massachusetts Mutual.	Springfield, Mass.	(<i>c</i>)					
Mutual Reserve Fund.	New York	332,500	78,500	216,500	\$2,305.74	2,000.00	2,000.00
Mutual Life.	do	248,787	75,000	304,217	6,801.81	50.15	50.15
Merchants Life Assurance of United States. <i>b</i>	St. Louis, Mo.						
New York Life.	New York	721,268	516,800	1,135,514	25,811.21	4,146.25	4,146.25
Northwestern Mutual.	Milwaukee, Wis.	214,700	135,136	336,518	(<i>c</i>)	2,000.00	2,000.00
National Life Assurance.	Hartford, Conn.	24,000	6,250	8,250	178.08	None.	None.
Union Central <i>b</i>	Cincinnati, Ohio						
State Life <i>b</i>	Indianapolis, Ind.						
Mutual Life Insurance of Kentucky. <i>b</i>	Louisville, Ky.						
Total.		1,696,448	906,186	2,212,142	35,096.84	8,363.40	8,363.40

a Entered late in 1897.*b* Entered 1896.*c* Not given.

RAILWAYS AND TRANSPORTATION.

History tells of no new country with a tithe of the transportation facilities possessed by Oklahoma. The Territory can be reached by direct trunk lines from any portion of the nation, and there is no portion of it but is reasonably accessible to railways and their attendant comforts and advantages.

Crossing the eastern portion of the Territory is the main north and south line of the greatest of American railway systems, the Atchison, Topeka and Santa Fe, giving a direct line to the Gulf on the south, the markets of Kansas City and Chicago to the north and east, and those of the mountains to the west, as well as an unbroken line to the Pacific. Running parallel and about 40 miles west of the Santa Fe is the Gulf line of the great Rock Island route, reaching the Gulf ports to the south; Kansas City, Omaha, and Chicago to the north and east, and Denver and the Rockies to the west. Across the southern portion of the Territory from east to west, and connecting the Santa Fe and Rock Island lines, is the Choctaw, Oklahoma and Gulf line, which east, in the Indian Territory, connects with the Missouri, Kansas and Texas, the Frisco, the Missouri Pacific, and the Pittsburg and Gulf, direct trunk lines to the Gulf, to the Mississippi, St. Louis, Kansas City, and Chicago, and from thence to all parts of the country.

In the northern part of the Territory is the Hutchinson and Southern road, entering the Territory at Manchester and running southeast as far as Blackwell, giving connection at Hutchinson with the Union Pacific and other lines. In the western part of the Territory the Pan Handle branch of the Santa Fe runs diagonally through Woods and Woodward counties, offering ready shipment for the agricultural products and the great herds of cattle of that vast country. Both the Santa Fe and the Rock Island touch the north line of Beaver County, in the extreme west, and the Missouri Pacific touches the north

line of the Territory at Caney, Arkansas City, and Kiowa, Kansas. The Frisco reaches it at Arkansas City and Hunnewell, Kans., August 15 will be running trains into the eastern part of the Territory over a new line.

Many new lines of railroads have been projected in Oklahoma the past year, nearly a dozen new companies having been chartered, and half as many surveys made for new lines or extensions of those in operation.

The first to build was the Hutchinson and Southern, which extended its line from Medford to Blackwell, a distance of 26 miles, and was running trains thereon by March 1, 1898. It is less than two years since this road built into the Territory, but their business is very satisfactory and they have put in first-class equipment, with good train sidings at the half dozen or more flourishing towns that have sprung up along their line. They are figuring on hauling 4,000 cars of coal out of the Territory this fall, and will extend their line a distance of 15 miles to a junction with the Santa Fe before winter.

In the winter the Choctaw ran a survey north from Shawnee to the west from Fort Reno. They decided to build the western line, and by July 1, 1898, were running cars into Geary, a town 17 miles west of Fort Reno, which in a few weeks had sprung from unbroken prairie into a flourishing city. This line will be extended 23 miles farther to Woodward in the eastern part of Custer County this fall, and will open up a vast trade in that western country, where the cheap coal and iron ore brought in by this line, coupled with a better and more convenient market, will be factors in the rapid development of these two counties. They have also extended their line in the Indian Territory.

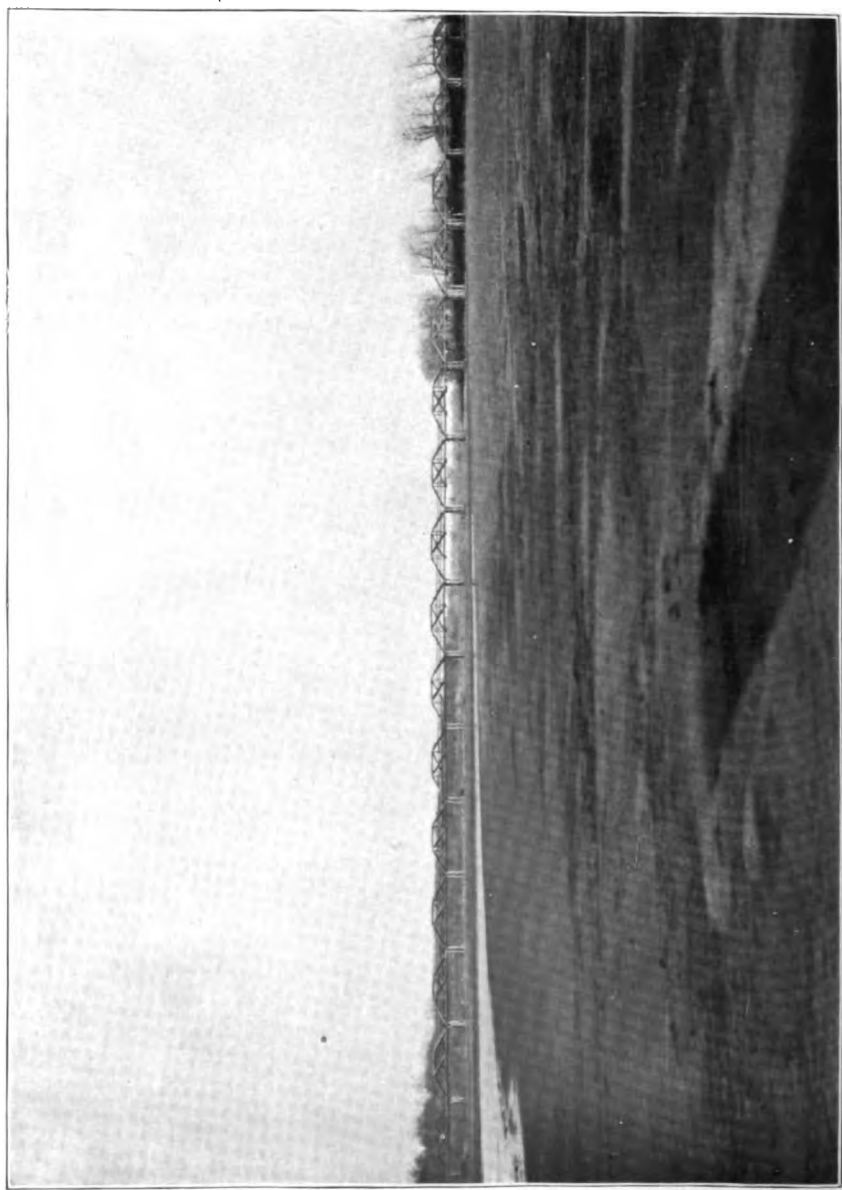
The Kansas and Southern Railroad Company have graded 10 miles of roadbed from Hunnewell into Kay County, but no iron has yet been laid.

The St. Louis and Oklahoma City road, in reality an extension of the Frisco, began to grade from Sapulpa, Ind. T., to Oklahoma City early in the spring, and by June 30 had 16 miles of steel laid. By the grading of two-thirds of the line was completed. They expect to have the road complete and cars running to Oklahoma City (a distance of 103 miles), by October 15, and to later extend farther southward.

The Kansas, Oklahoma and Southern Railway is now grading a new section of its line near Bartlesville and expects to push on to Pawhuska, Pawnee, Stillwater, Guthrie, and El Reno from Coffeyville, Kans., within the year. Lines are also projected in various directions all over the Territory, but no work has been done on them.

The Rock Island road has built no extensions during the year, but has put in nearly two miles of siding and is now at work on more; a new depot has been put in at Darlington and the train service is much improved.

The Atchison, Topeka and Santa Fe have been improving and renovating their whole line through the Territory to better accommodate their rapidly growing business in Oklahoma and to handle the immense Gulf traffic. During the year the company laid 62 miles of steel and ballasted 40 miles of track in the Territory with crushed stone, have replaced a large number of ties, have replaced several wooden bridges with steel ones, making a total of 740 feet of steel bridges, have rebuilt half a dozen old bridges, and are building many new stone arches. They have also completed a new depot at Sewar, a depot, reading room, bathrooms, and eating house at Purcell, and an eating house and reading room at Woodward; have put in four additional 2,000-foot passing tracks and 8,500 feet of side track to accom-



BRIDGE ACROSS CIMARRON RIVER, AT PERKINS.

new elevators, grain bins, coal bins, lumber yards, and other local industries, at different points between Arkansas City and Purcell.

The coming year they expect to complete the stone ballasting, replace all the old bridges with new, put in the block system, and make many more improvements in Oklahoma, and also contemplate spending \$1,500,000 improving the line from Oklahoma to the Gulf.

COMMERCE.

The commerce of Oklahoma, both local and foreign, has increased at a very rapid ratio in the past few years, and the freight carried by the railways out of and into the Territory the past year has been more than double that of any previous year. Oklahoma wheat has been going to the elevators of the North and East and to the Gulf, and thence to foreign lands; flour has gone to Central and South America by the cargo; train loads of cotton to Liverpool and even to far-off Japan; fruits, melons, and vegetables to even the other fruit belts of the nation; cattle and hogs to every market of the nation and to many foreign lands, while implements, vehicles, dry goods, clothing, and various other supplies have been coming in in greatly increasing quantities, and household goods and other emigrant possessions have filled many trains and added largely to the aggregate of business. The two trunk lines passing through the Territory find the Oklahoma portion of their lines the best paying of their entire system. Take Guthrie, for example; the increase of freight business each month of the year was greater than the entire business for any previous month in the history of the Territory. The commerce toward the Gulf the past year has increased very perceptibly, and I believe it would be greatly to the advantage of the entire Territory to cultivate still closer trade relations with the Gulf ports.

The following abstract of business done in certain lines at their different stations in Oklahoma, as furnished by the several railroads in the Territory, gives some idea of the huge proportions of the Territory's commerce:

CHICAGO, ROCK ISLAND, AND PACIFIC.

Goods shipped from stations in Territory.

Commodities.	Reufrow.	Medford.	Jefferson.	Pond Creek.	Kremlin.	North End.	End.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
Merchandise	39,502	430,893	131,216	506,087	40,325	367,683	3,825,734
Machinery	6,400	104,900	5,020	20,000	10,000	224,000	113,800
Wheat	14,858,570	21,209,690	5,384,193	17,924,013	11,798,508	25,259,810	50,253,705
Corn	758,310	2,553,486	3,524,110	4,192,420	774,830	983,310	600,255
Rye			25,200				
Oats		30,800		33,000			24,000
Seed		147,648	25,200	209,250	24,135	155	886,400
Mill stuffs		88,000	57,000			117,540	1,083,460
Broom corn		66,900	75,650	421,435	15,140	400,810	807,005
Butter	1,570		1,575		317	2,300	
Hides	58	1,745	2,455				
Flour		1,239,709	66,820			434,670	1,599,093
Salt		7,394,060					
Eggs	39,439	1,244	28,141	2,725	4,713	6,510	36,655
Milk		7,065				58,455	
Fruit (green)		93,400	436,905	24,350			52,900
Cattle		2,807,480	661,100	568,600	50,600	19,000	1,047,200
Sheep				266,500			
Hogs	352,220	1,210,350	389,830	1,536,840	448,630	882,220	3,025,200
Hay	2,809,000	4,212,327	597,700	157,600	198,900	156,000	231,200
Horses	3,000	102,000			2,000		120,000
Cotton			13,200	79,010			483,911
Total of all shipments from the station	18,870,549	42,000,857	11,750,155	25,967,240	13,317,198	29,097,728	63,885,518

CHICAGO, ROCK ISLAND, AND PACIFIC—continued.

Goods shipped from stations in Territory—Continued.

Commodity.	Waukomis.	Hennessey.	Dover.	Kingfisher.	Okarche.	El Reno.	Union City.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
Merchandise	169,627	812,445	37,038	1,815,943	181,831	5,215,845	44,905
Machinery		76,810		107,500	88,100	215,300	21,600
Wheat	24,027,185	47,885,144	1,782,190	62,108,410	23,186,745	21,315,216	
Corn	161,100	49,650				24,000	139,300
Rye						33,020	
Oats	237,000	117,900		531,430	83,000	1,711,095	32,100
Barley				24,000			
Potatoes		26,000		24,500		78,500	
Seed		878,110	555,640	1,404,550	63,240	2,091,450	300
Millstuffs		817,400		927,160		2,357,810	
Broom corn				258,690		42,275	
Butter	3,055	9,936		16,225	2,582	16,750	
Hides	1,410	7,199		37,946		26,940	
Flour		29,216		2,736,164		7,028,233	
Salt						24,000	
Eggs	13,420	54,131		135,248	12,564	24,785	1,400
Milk	22,660	7,150		46,971			
Fruits (green)		22,500				88,165	150
Cattle	418,000	679,900	19,000	1,567,000	184,500	903,300	128,200
Hogs	758,650	1,707,530	78,920	1,200,130	33,700	1,142,080	306,100
Horses		3,000		20,000			
Hay	20,000						
Cotton		814,186	276,807	2,055,389		7,196,772	
Total all shipments from the station.	25,872,107	54,249,482	4,736,860	78,330,850	26,972,713	188,344,291	682,325

Farm implements, vehicles, etc., shipped into the Territory.

Station.	Implements.	Vehicles.	Machines.	Emigrant movables.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
Renfrow	46,700	25,000	59,205	89,495
Medford	425,735	47,400	415,350	178,000
Jefferson	166,275	56,120	95,205	105,505
Pond Creek	242,300	107,700	309,550	254,700
Kremlin	168,100	23,900	80,700	180,900
North Enid	199,150		301,000	208,650
Enid	1,742,705	890,350	968,490	1,000,835
Waukomis	189,500	82,000	220,000	325,885
Hennessey	872,148	232,150	538,585	257,351
Dover			8,000	2,330
Kingfisher	1,500,500	674,520	1,090,680	630,550
Okarche	353,000	28,600	279,300	178,730
El Reno	1,153,750	538,080	634,517	958,708
Union City	22,700	890	89,180	92,465
Total	7,082,563	2,656,710	5,090,237	4,470,152

CHOCTAW, OKLAHOMA AND GULF RAILWAY.

Shipments from stations in Territory, in carloads.

Station.	Wheat.	Flour.	Corn.	Oats.	Other mill products.
El Reno	222	215	5	46	175
Yukon	627	20	21	93	37
Council	55		1	13	
Oklahoma City	124	249	40	95	122
Dixon	7				
Choctaw City	54		1		
Total	1,089	484	68	247	334

CHOCTAW, OKLAHOMA AND GULF RAILWAY—continued.

Shipments from stations in Territory, in carloads—Continued.

Station.	Cattle.	Hogs.	Cotton.	Cotton seed.
			<i>Bales.</i>	
El Reno.....	2	2	2, 394	27
Yukon.....	10	62		
Council.....	5	2		
Oklahoma City.....	6	4	1, 517	15
Choctaw City.....	6	3	2, 956	78
McLoud.....	2	1	3, 447	74
Dale.....	9	34	458	
Shawnee.....	48	59	25, 334	874
Tecumseh Junction.....			9, 803	101
Earlboro.....	17	29	1, 208	25
Total.....	105	196	48, 112	694

HUTCHISON AND SOUTHERN RAILWAY.

Number of cars shipped out of the Territory.

Cattle.....	17
Hogs.....	92
Horses.....	1
Wheat.....	559
Corn.....	33

Number of cars shipped into the Territory.

Machinery and implements.....	50
Vehicles of all kinds.....	5
Household furniture.....	5

ATCHISON, TOPEKA & SANTE FE RAILWAY.

Number of cars shipped out of the Territory.

Cattle.....	3, 771
Hogs.....	1, 672
Sheep.....	25
Horses.....	20
Wheat.....	5, 666
Corn.....	487
Other grain.....	143
Castor beans.....	120
Flour.....	381
Mill products.....	173
Cotton-seed products.....	623
Cotton.....	bales.. 46, 210

Number of cars shipped into the Territory.

Agricultural implements.....	215
Vehicles of all kinds.....	64
Household goods.....	226

TELEGRAPH AND TELEPHONE.

The Western Union Telegraph Company has well-managed and well-equipped offices in every railroad town in the Territory. Their business has shown a large increase the past year, and they have run three new wires into the Territory and are increasing their facilities in other ways. The Missouri and Kansas Telephone Company operate exchanges

at Guthrie, Oklahoma City, and El Reno, and will put in p Norman and Ponca in the near future. They also have long-connections between Fort Reno, El Reno, Yukon, Oklahoma Edmond, Waterloo, Seward, Council Grove, Darlington, and and expect soon to extend their line north from Guthrie to com at Arkansas City, Kans., with Wichita, Topeka, Kansas Co other points; also, a line from El Reno to Kingfisher. Local co contemplate putting in exchanges at Newkirk and Shawnee th

The Perkins Telephone Company has a line from Guthrie water, Perkins, Langston, Morrison, Pawnee, Perry, Chandler Carney, and Sac and Fox Agency, while other lines run from C to Stroud, Wellston, Shawnee, Tecumseh, and Oklahoma City; line connects Newkirk and Blackwell with Arkansas City, Ka these lines are doing a paying business, and in a short time eve in the Territory will have either telephone or telegraph connec

CLIMATE.

Few portions of the continent have a more attractive climate round than Oklahoma. True, there are occasional disagreeab but they are succeeded by others so perfect that the hours of di pass quickly from the memory.

The winters are mild and pleasant, the spring and fall deligh while the summers are hot there is almost a continual breeze, s but very few exceptions the nights are cool and pleasant, a refreshing sleep to all.

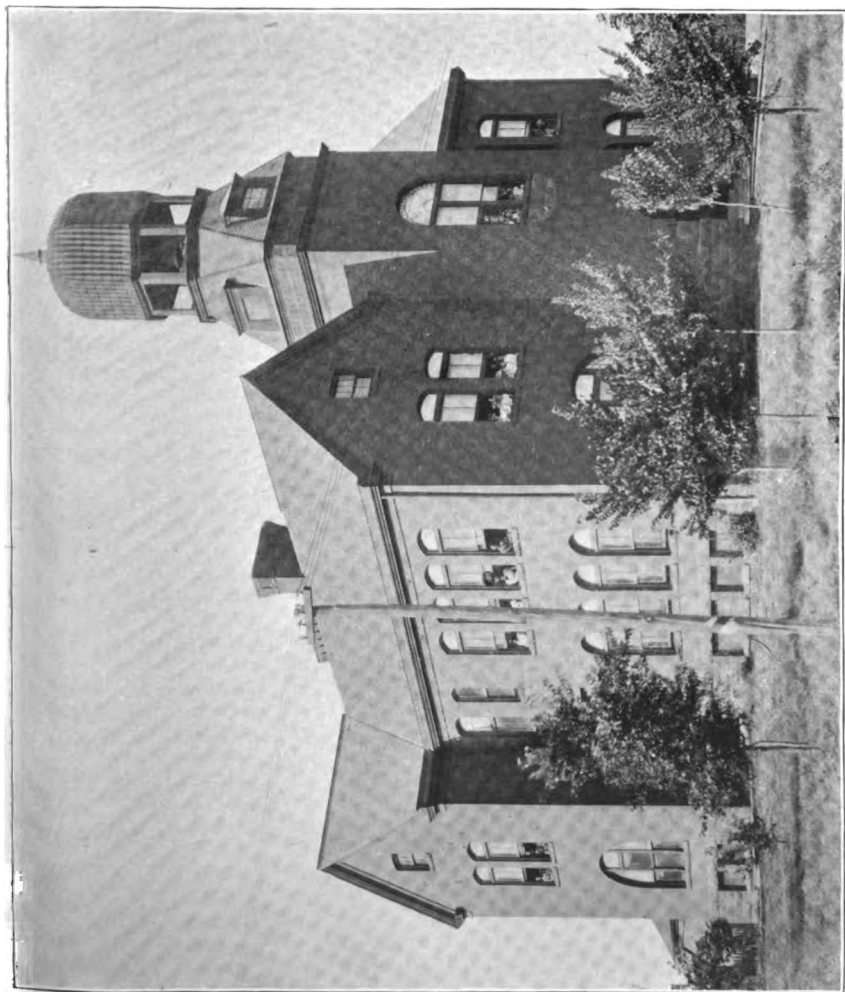
The dryness of the air, the ever-present sunshine, and the days that are cloudy or gloomy make it a delightful place for t out worker, invalid, or consumptive, and many have been res health whose days seemed numbered at their coming. Rheu that terror of the North and East, is almost unknown, an remarkable cures are reported from the influence of the clima effects of bathing in the salt and mineral impregnated water Cimarron or Salt Fork rivers.

The conditions of air, the temperature the year round, and t fall of the Territory seem to be not only pleasant and healthfu people, but favorable to the growth and development of flower vegetables, grain, and other products.

TEMPERATURE AND RAINFALL.

Meteorological observations are daily made at the Territoria ment station, at army posts, and by volunteer observers at places in Oklahoma and Indian Territories. Reports are forw Oklahoma City, at which place the climate and crop servic Weather Bureau of the United States Department of Agricultu tains a central office for this section, under the direction of Widmeyer, who is also observer at that point.

The accompanying tables have been compiled by Mr. Widm from data furnished by him. They are worthy of a careful stu knowledge of the climatic conditions is especially important in settled agricultural region. As there are marked variations fr to year, summaries are given as to rainfall at different places of several years, especially at Oklahoma City and Fort Reno, a places the observations have been made either by specially observers or under the direction of army officers.



GUTHRIE HIGH SCHOOL.

The reports from a number of places are not complete for the year, but give facts for most of the months. In each of the tables places marked with an asterisk (*) are in the Indian Territory, the others in Oklahoma.

The rainfall for 1898, up to July 25, was—

	Inches.
January	4.38
February	2.37
March	2.34
April .....	.95
May	9.96
June	1.75
July (to 25th)	3.27
Total	25.02

as compared with 23.50 inches for the same period in 1897.

Precipitation in inches by months in 1897.

	Latitude.	Longitude.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Alva	36.48	98.40	1.50	1.55	1.60	3.40	4.00	1.70	.90	5.40	2.40	.....	.....	.....	.....
Arapahoe	35.30	98.55	1.56	.46	1.71	4.22	8.80	2.85	1.74	1.65	2.30	.99	.18	.....	23 26.69
Anadarko	35.08	98.15	.60	1.20	3.37	3.32	7.12	2.60	2.19	.92	.35	1.72	.25	.....	30 23.94
Burnett	35.10	97.10	1.75	1.20	5.24	4.41	5.85	3.37	2.42	2.32	2.93	1.61	1.61	.....	76 33.47
Clifton	35.30	96.55	1.19	1.25	4.82	9.22	3.61	2.64	3.63	2.73	.60	1.26	.77	.....	97 32.69
Edmond .....	.....	.....	.86	1.86	3.69	13.35	6.29	2.05	.....	.....	.76	.37	.70	.....	77
Fort Sill	34.40	98.23	1.50	.39	2.62	.80	8.07	2.80	1.95	2.37	1.75	2.73	.49	.....	80 26.27
Fort Reno	35.33	98.01	1.10	1.55	1.80	7.36	6.07	2.69	.66	1.01	1.27	1.28	.37	.....	50 25.66
Hennessey	36.12	97.57	.58	.79	.....	5.39	7.22	1.40	.88	4.09	8.10	1.11	T.	.....	20
* Healdton	34.10	97.25	2.67	.34	4.85	2.55	8.41	3.85	2.05	4.80	2.34	2.52	T.	.....	1.95 36.33
* Lehigh	34.26	96.10	6.00	.42	8.13	4.83	3.94	4.59	3.01	.43	.25	1.93	T.	.....	4.27 37.80
Mangum	34.48	99.32	1.82	.26	1.48	2.72	3.52	3.23	2.28	2.91	2.78	.92	.36	.....	21 22.49
Norman	35.20	97.30	1.22	1.15	4.43	4.87	6.07	5.35	2.34	1.60	1.02	1.38	.55	.....	86 31.14
Jefferson	36.45	97.50	.91	1.02	2.65	5.80	4.96	5.15	1.15	5.48	1.36	.72	.00	.....	50 29.70
Prudence .....	.....	.....	1.65	1.50	2.68	6.49	8.26	3.81	1.59	3.89	4.49	1.08	T.	.....	71 36.15
Oklahoma	35.26	97.33	1.10	1.32	4.71	5.87	6.02	2.58	1.90	1.66	1.22	.81	.58	.....	70 28.47
Sac and Fox Agency	35.30	96.40	1.40	1.30	5.80	7.90	3.90	2.50	2.70	2.40	1.60	1.00	.70	.....	.....
Stillwater	36.10	97.05	.81	1.51	3.62	6.36	4.77	4.13	2.63	4.51	.71	.97	.80	.....	87 31.69
* Tahlequa	34.48	94.58	6.83	1.25	5.36	6.60	4.59	3.45	.....	5.47	.98	1.00	1.38	1.05	.....
Wankomis .....	.....	.....	.78	.24	2.32	4.15	5.38	1.22	2.27	2.85	2.25	1.26	.00	.....	.48 23.13
Winnview	36.10	98.30	1.53	.81	2.29	4.49	7.42	2.33	1.54	1.08	2.25	2.36	.03	.....	.42 26.55
Wagoner .....	.....	.....	3.26	.90	3.26	2.24	.26	4.07	3.22	4.37	T.	1.29	1.19	1.30	25.26
* South McAlester	34.56	95.47	4.12	.00	8.50	7.75	2.70	6.50	2.45	2.37	.41	.99	1.22	5.22	42.23
South McAlester	34.56	95.47	4.12	.00	8.50	7.75	2.70	6.50	2.45	2.37	.41	.99	1.22	5.22	42.23
* Tulsa	36.08	95.56	2.40	.97	6.70	5.60	.80	2.20	3.72	4.24	.00	1.22	1.27	1.08	30.22

Temperature records for 1897.

	Latitude.	Longitude.	Temperature.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
Arapahoe	35.30	98.55	Mean..	31.0	39.8	49.0	58.6	67.2	76.6	82.2	80.4	75.0	64.3	47.8	34.2	58.8
			Max ..	57.0	72.0	87.0	91.0	100.0	107.0	107.0	105.0	92.0	82.0	67.0	40.0	....
			Min ..	3.0	14.0	14.0	31.0	42.0	45.0	54.0	55.0	49.0	29.0	7.0	1.0	....
Anadarko	35.08	98.15	Mean..	36.0	45.2	52.8	61.7	68.0	78.2	83.2	78.0	75.7	67.4	52.0	39.0	61.4
			Max ..	77.0	80.0	87.0	90.0	100.0	104.0	106.0	103.0	96.0	95.0	75.0	....	....
			Min ..	1.0	15.0	18.0	32.0	49.0	43.0	51.0	51.0	42.0	31.0	14.0	4.0	....
Burnett	35.10	97.10	Mean..	33.7	41.8	51.7	59.9	66.0	76.2	80.3	77.0	72.6	64.4	50.6	36.2	59.2
			Max ..	67.0	77.0	86.0	93.0	98.0	104.0	102.0	100.0	98.0	92.0	80.0	74.0	....
			Min ..	1.0	15.0	18.0	34.0	39.0	47.0	48.0	54.0	41.0	32.0	15.0	8.0	....
Clifton	35.30	96.55	Mean..	33.0	41.6	51.8	60.8	67.4	77.4	81.5	78.0	74.1	65.4	48.7	36.0	....
			Max ..	66.0	73.0	87.0	95.0	99.0	102.0	103.0	102.0	96.0	88.0	75.0	....	....
			Min ..	-2.0	13.0	17.0	32.0	39.0	45.0	54.0	54.0	38.0	31.0	12.0	7.0	....
Fort Reno	35.33	98.01	Mean..	33.4	42.6	51.8	58.8	65.6	75.3	81.0	79.1	75.4	64.4	50.2	37.8	59.6
			Max ..	62.0	75.0	86.0	92.0	98.0	104.0	107.0	103.0	99.0	98.0	80.0	69.0	....
			Min ..	2.0	12.0	11.0	32.0	42.0	46.0	56.0	57.0	48.0	33.0	10.0	0.0	....
Fort Sill	34.40	98.23	Mean..	35.1	44.0	52.6	60.4	67.2	76.2	81.8	79.9	74.8	66.1	51.7	35.7	60.5
			Max ..	64.0	76.0	83.0	94.0	98.0	106.0	106.0	101.0	99.0	91.0	82.0	72.0	....
			Min ..	5.0	20.0	18.0	34.0	43.0	48.0	55.0	56.0	48.0	34.0	16.0	4.0	....
* Healdton	34.10	97.25	Mean..	37.4	47.1	56.3	63.0	67.4	78.4	83.1	79.6	74.2	64.9	53.9	39.9	62.0
			Max ..	68.0	82.0	88.0	97.0	101.0	107.0	107.0	102.0	95.0	87.0	82.0	76.0	....
			Min ..	6.0	15.0	20.0	37.0	45.0	53.0	52.0	59.0	48.0	35.0	16.0	9.0	....
Jefferson	36.45	97.50	Mean..	36.6	41.8	53.0	61.0	67.4	77.7	83.2	82.4	76.2	64.4	50.6	36.4	....
			Max ..	72.0	90.0	99.0	109.0	113.0	115.0	115.0	110.0	99.0	97.0	85.0	75.0	....
			Min ..	-2.0	12.0	11.0	28.0	40.0	42.0	54.0	58.0	46.0	30.0	11.0	5.0	....
* Lehigh	34.32	96.10	Mean..	37.1	46.0	55.2	60.8	68.0	76.5	82.5	81.4	76.0	67.7	53.2	39.9	76.0
			Max ..	66.0	83.0	97.0	102.0	108.0	108.0	104.0	108.0	103.0	98.0	85.0	78.0	....
			Min ..	6.0	17.0	24.0	37.0	42.0	50.0	54.0	53.0	36.0	33.0	14.0	11.0	....
Mangum	34.48	99.32	Mean..	36.6	45.6	51.4	60.0	67.0	77.0	80.8	78.8	73.6	63.9	50.0	36.8	60.1
			Max ..	70.0	80.0	84.0	92.0	98.0	104.0	106.0	105.0	101.0	91.0	87.0	74.0	....
			Min ..	6.0	17.0	16.0	32.0	42.0	42.0	55.0	53.0	48.0	28.0	14.0	3.0	....
Norman			Mean..	35.0	44.5	51.8	60.5	68.3	77.4	83.6	79.7	76.5	66.5	50.0	37.3	61.0
			Max ..	63.0	76.0	85.0	97.0	109.0	107.0	106.0	104.0	102.0	94.0	82.0	73.0	....
			Min ..	2.0	19.0	17.0	31.0	47.0	46.0	55.0	54.0	45.0	32.0	13.0	6.0	....
Oklahoma City	35.26	97.33	Mean..	34.8	42.1	50.4	59.6	65.8	75.4	80.8	78.4	75.2	66.0	48.6	35.6	59.4
			Max ..	63.0	74.0	84.0	90.0	98.0	104.0	103.0	98.0	96.0	91.0	78.0	70.0	....
			Min ..	3.0	19.0	18.0	37.0	42.0	48.0	57.0	56.0	49.0	36.0	11.0	6.0	....
Sac and Fox Agency	35.30	96.40	Mean..	33.6	40.7	51.2	59.0	66.0	76.0	80.9	78.1	74.4	65.4	48.0	....	....
			Max ..	68.0	78.0	86.0	93.0	98.0	107.0	104.0	102.0	101.0	95.0	88.0	....	....
			Min ..	0.0	15.0	11.0	32.0	40.0	43.0	50.0	53.0	38.0	29.0	12.0	....	....
Stillwater	36.10	97.05	Mean..	32.1	41.4	51.2	58.3	65.4	75.6	81.2	77.2	74.2	64.2	47.0	32.4	58.4
			Max ..	64.0	76.0	88.0	93.0	98.0	106.0	106.0	100.0	98.0	94.0	82.0	66.0	....
			Min ..	3.0	17.0	16.0	32.0	41.0	44.0	51.0	56.0	40.0	30.0	8.0	4.0	....
Waukomis			Mean..	30.9	40.1	49.8	57.9	66.0	78.2	83.6	82.4	75.4	65.2	43.3	36.2	59.1
			Max ..	60.0	73.0	88.0	97.0	102.0	104.0	107.0	105.0	100.0	98.0	80.0	68.0	....
			Min ..	1.0	10.0	12.0	31.0	40.0	44.0	54.0	65.0	51.0	32.0	12.0	2.0	....
Prudence			Mean..	33.6	41.7	49.8	58.5	66.2	77.0	80.1	79.0	73.2	62.7	46.0	33.6	58.4
			Max ..	61.0	78.0	91.0	97.0	102.0	102.0	106.0	104.0	97.0	82.0	76.0	63.0	....
			Min ..	-5.0	15.0	12.0	30.0	36.0	36.0	56.0	54.0	50.0	32.0	9.0	2.0	....

First and last killing frosts at Oklahoma stations, 1897.

Stations.	Last of spring.	First of autumn.	Stations.	Last of spring.	First of autumn.
Alva	Mar. 25	Oct. 29	Norman	Apr. 9	Oct. 29
Arapahoe	Apr. 9	Do.	Pond Creek	Apr. 16	Do.
Anadarko	do	Do.	Prudence	Apr. 14	Do.
Burnett	Mar. 25	Do.	* Purcell	Apr. 9	Do.
Clifton	Apr. 9	Do.	Sac and Fox Agency	do	Do.
Edmond	Mar. 24	Nov. 2	Stillwater	do	Do.
Fort Reno	Apr. 11	Do.	Waukomis	Apr. 16	Do.
Fort Sill	Mar. 23	Do.	Winnview	Mar. 25	Do.
Guthrie	do	Do.	Woodward	Apr. 14	Do.
Hennessey	Apr. 16	Oct. 29	Wagoner	Mar. 24	Do.
* Healdton	Mar. 24	Nov. 2	* South McAlester	Mar. 17	Do.
Kemp	Mar. 23	Do.	Kingfisher	Apr. 14	Do.
Keokuk Falls	Apr. 8	Do.	Ponca City	Apr. 9	Do.
* Lehigh	Mar. 24	Nov. 2	Newkirk	do	Do.
Mangum	Apr. 14	Oct. 29			

Monthly mean temperature, Oklahoma, Okla.

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	An- nual.
1891	37.8	39.2	43.6	60.8	64.4	74.3	76.2	76.8	72.4	60.8	47.0	44.4	58.1
1892	33.0	44.5	44.6	59.2	66.2	75.1	79.0	77.0	72.4	62.0	48.0	35.6	58.0
1893	37.6	35.8	50.2	62.4	65.4	76.2	81.2	75.2	74.4	61.7	45.4	43.7	59.1
1894	36.8	34.8	52.6	62.9	68.2	75.5	79.4	78.4	74.4	64.0	49.8	41.6	59.9
1895	33.2	29.5	50.0	63.1	69.3	76.8	78.3	79.1	76.1	55.7	45.0	38.4	57.9
1896	39.4	43.4	46.4	66.1	73.3	76.7	80.7	83.2	71.0	59.2	46.8	45.2	61.0
1897	34.8	42.1	50.4	59.6	65.8	75.4	80.8	78.4	75.2	66.0	48.6	35.6	59.4
Average	36.1	38.5	48.2	62.0	67.5	75.7	79.4	78.3	73.8	61.3	47.2	40.6	59.0

Rainfall, Oklahoma, Okla.

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	An- nual.
1891	2.48	0.44	3.04	4.30	5.92	4.73	6.17	0.79	5.43	0.31	1.17	2.65	37.43
1892 .....	.93	2.22	3.17	1.33	11.90	2.48	3.66	4.27	1.29	4.68	1.01	5.35	42.29
1893 .....	.43	.69	1.25	3.12	1.53	1.60	3.80	5.65	3.20	.06	1.26	1.69	24.28
1894	3.74	1.11	4.79	2.82	1.87	3.71	1.66	1.95	1.65	1.84	.07	1.51	26.72
1895 .....	.93	.07	.82	.41	1.34	3.11	5.95	4.44	2.93	2.93	5.79	3.78	32.49
1896 .....	.45	.14	1.03	1.07	4.62	3.32	1.81	1.83	2.14	1.91	2.41	1.22	21.90
1897	1.10	1.32	4.71	5.87	6.02	2.58	1.90	1.66	1.22	.81	.58	.70	28.47
Average	1.44	.85	2.69	2.70	4.74	3.07	3.56	2.94	2.55	1.79	1.75	2.41	30.49

Rainfall at Fort Reno, Okla.

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	An- nual.
1891	2.02	0.13	2.47	2.10	3.02	5.02	6.97	1.02	1.17	0.30	0.85	1.70	26.77
1892 .....	.66	1.00	3.10	1.12	7.37	2.62	1.80	4.30	1.03	5.21	0	4.40	33.51
1893 .....	.30	.72	1.90	1.92	1.88	3.25	5.62	10.25	1.17	.90	.93	1.46	29.40
1894	1.51	.50	1.90	3.30	1.30	1.10	1.31	1.61	3.16	1.49	1.00	.10	18.28
1895	1.13	.75	.25	1.74	.94	2.41	2.24	4.45	.60	2.53	3.24	2.50	22.78
1896 .....	.40	.30	.60	1.05	1.50	1.29	4.05	3.31	1.85	2.18	1.30	1.30	19.13
1897	1.10	1.55	1.80	7.36	6.07	2.69	.66	1.01	1.27	1.28	.37	.50	25.66
Average	1.02	.71	1.72	2.65	3.15	2.62	3.23	3.70	1.59	1.85	1.09	1.71	25.04

Rainfall for places and years indicated.

Place.	County.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.
Burnett	Pottawatomie				45.84	27.75	25.10	36.17	26.08	33.47
Fort Reno	Canadian	81.91	28.79	26.77	33.51	29.40	18.28	22.78	19.13	25.66
Fort Sill	Comanche, Ind. T.	29.29	31.08	32.76	34.32	24.19	24.08	29.17	17.12	26.29
Fort Supply	Woodward	23.61	18.26	30.43	21.69	13.15	18.24			
Guthrie	Logan				37.98		22.99	30.71	31.71	
Mangum	Greer				27.20	11.39	19.52	32.89	22.85	22.49
Oklahoma	Oklahoma			37.43	42.29	24.28	26.72	32.49	21.90	28.47
Jefferson	Grant						17.79	21.56	26.01	29.70
* Purcell	Chickasaw, Ind. T.				40.03	32.38	24.88		31.28	
* Tulsa	Creek, Ind. T.	26.28	34.15	24.80	46.16	34.12	27.09	46.81	23.80	30.22
Winnview	Blaine			19.34			22.98	26.19	21.72	26.55

AGRICULTURE.

Oklahoma is largely an agricultural and stock-raising country, and the great majority of the people of the Territory are engaged in these pursuits.

While the soil of the Territory presents a decided variety in appearance and composition, it is generally fertile, well supplied with plant food, and holds moisture for a reasonable length of time. The soil, rain-

fall, and climate present a combination that renders possible the able growing of the leading crops of both the North and the South.

No system has been perfected by which aggregate acreage or yield of the different crops can be fully estimated. As a whole, the crops of 1897 were very good, and the farmers of the Territory all made a decided advance in their financial condition.

The last half of 1897 was as propitious for the maturing of crops as the first half was for their early growth, and the general crops of the Territory were even greater than anticipated at the time I submitted my last report. The present year has been an ideal one for growing crops, trees, fruits, and everything needed to make agriculture, horticulture, and stock raising an unqualified success.

PRESENT CROP CONDITIONS.

The report of the Oklahoma section of climate and crop service of the United States Department of Agriculture for the last week of October 1897, tells of the general crop conditions in the Territory, as follows:

The weather during the week, until Sunday evening, was hot and dry. Sunday night and Monday, with local thunder storms over small areas. The average temperature for the week, 81.2 degrees, is 3.2 degrees above the normal.

The prevailing weather conditions have been very favorable for the harvest of wheat and oats, the principal work of the week, for the cultivation of corn and late crops, and for growth of corn, cotton, kafir, castor beans, grass, and forage crops.

High southerly winds prevailed from Friday until Sunday evening, which absorbed surface moisture, and while the ground is yet in fairly good condition, rains this coming week will be required for the best results to the growing crops. Only in portions of Woods County is there a lack of sufficient moisture at the present time.

Wheat.—Throughout the northern, central, eastern, and southern sections of the Territory is about all in shock. In the western section the harvest is about half done. The weather has been most favorable for this work, and the crop has been well shocked in good condition. A few fields of wheat have been thrashed, showing about an average yield.

Oats.—This crop has been cut in the southern section and being harvested elsewhere. The crop is generally reported light, having been badly damaged by the crop is reported best in Greer county, southwest.

Corn.—Corn has grown rapidly all week and is generally in fine condition. Far there has been sufficient rainfall, but the ground is now getting dry on the surface and a general rain this week will be necessary for best results to this crop.

Cotton.—Cotton has made a vigorous growth during the week; cotton that was up from first planting and withstood the unfavorable conditions early in the season is now forming squares and a few fields show bloom. The most of the crop, however, is backward.

Grass has made a good growth and haymaking will soon be general. Very little hay has, as yet, been made. It is thought a large crop is assured.

All late crops have made a satisfactory showing during the week.

WHEAT.

Of the various crops grown in the Territory last year wheat was the largest acreage. It is doubtful if any equal area in any other year ever gave so large an average yield. At the experiment station on upland prairie soil, a number of plats gave yields ranging from 30 to 58 bushels per acre, and the average yield of eighty-three different varieties, including many varieties, was almost 40 bushels per acre.

Hundreds of fields in different parts of the Territory yield an average of 40 to 45 bushels, and many authenticated yields of 50 bushels and over are reported. The total yield of the Territory in 1897 was about 20,000,000 bushels. The acreage for this year was considerably larger, and wheat never looked better than it did



GARFIELD COUNTY CORNFIELD.

year in Oklahoma. It was confidently predicted that the yield would exceed 25,000,000 bushels, but since harvest it has been discovered that the spring growth was so rapid that the grain did not properly fill out, and the yield is not as good as last year in some localities. Some yields as low as 10 and 12 bushels are reported, but other localities yield 25 and 30 and over, and the general average will be over 20 bushels to the acre, making the crop in the aggregate about equal to that of last year. Wheat raising has long since passed the experimental stage in every part of the Territory, and Oklahoma will henceforth be included in the wheat estimates of the world.

It is a crop so sure and the yield so large that it brings certain prosperity to the farmer who gives it proper attention. Much of last year's crop of wheat was held until the spring of 1898, and sold at \$1 per bushel, and it is estimated that the wheat crop of the year brought the farmers of the Territory from thirteen to fifteen millions of dollars.

It is generally considered that in a new country the farmers do not have granaries and sell their wheat early in the season, but when wheat went to a dollar this last spring it was a general surprise to everybody to find what a large part of last year's crop was still in the hands of the farmer.

Many individual farmers brought in from 1,000 to 3,000 bushels, and one Logan County farmer, who came to the Territory nine years ago without a dollar, sold 7,000 bushels at 95 cents per bushel. In Oklahoma County a number of farmers went together, loaded an entire train and shipped direct to the Chicago market. Most of the wheat of the Territory is grown on small farms, but there are some very large growers. In the Osage Reservation are numerous fields of 1,000 to 1,500 acres, and one grower in the Ponca Reservation raised 20,000 bushels this year and is preparing to put in 4,000 acres this fall.

CORN.

Oklahoma raises millions of bushels of corn, but the greater part of it is marketed in the form of cattle, hogs, and other live stock. Last year's corn was affected by hot weather and lack of rain at a critical period in its growth, and in some localities by hot winds. Many good yields were reported. The experiment station had yields up to 62 bushels per acre on creek bottom land. On upland it had large yields of good fodder, but the yield of grain probably did not reach 20 bushels on any plat.

In the great river bottom lands many yields of 75 and 80 bushels and over per acre were reported and recorded. Bottom-land corn made a general average of 40 bushels and over per acre. On the upland, where put in early and properly cultivated, the yield was also good; and there was scarcely a locality in the Territory where the crop did not pay well. In the corn sections the farmers are largely hog raisers too, and thus get their corn readily into shape to go to market on foot. Many thousands of head of cattle are brought into the Territory during the winter to feed for market, giving the farmer with a surplus of corn a ready market at a good price, not only for the corn, but for the fodder and other roughness. Under ordinarily favorable conditions corn produces enormously in the Territory, growing to a height almost beyond belief and producing ears of prodigious size. This year the weather and rainfall have been just right for the growth and development of this cereal, and at this early date an enormous crop is assured. Stalks 10, 14, and 16 feet in height are on exhibition, with the immense ears so high from the ground that a man can not reach them, and they

have not yet attained their full growth. The acreage is much larger than usual, and the corn crop of the Territory will be millions of bushels in excess of any preceding year. This increased crop of corn and fodder, together with the fact that cattle brought in during the winter months to fatten are not taxed, offer splendid inducements to stock men all over the Southwest to bring their herds here to be "finished for market."

The western counties of the Territory report a largely increased acreage this year with every prospect of the largest yield in the history of the Territory, and cattle men are already contracting for entire crops at good prices.

COTTON.

Cotton ranks first as the ready-money crop of the Territory. While it is not generally considered that Oklahoma is in the cotton belt, and not longer ago than five years farmers declared that cotton could not be profitably grown in the Territory, the shipments for the past year were 140,000 bales, valued at nearly \$5,000,000 and requiring 5,000 cars to ship. The acreage for 1897 was large; it was an ideal cotton-growing year and the yield was in many instances unprecedented. Many growers report a bale to an acre, three-fourths bale yields were not uncommon, and the general average for the Territory exceeded half a bale. This average is better than can be attained almost anywhere in the South, and Oklahoma cotton always ranks high as to quality. Cotton buyers of long experience in the South claim that as a whole the cotton district in Oklahoma surpasses in every way any similar district to be found elsewhere in the United States.

The extreme low price of cotton last year discouraged many growers, and the acreage is much less this year. Cotton, like everything else, presents excellent prospects for a phenomenal yield this year, however, and it is believed that the Territory will produce not less than 125,000 bales.

One feature about cotton growing which makes it desirable is the fact that every dollar received for the crop is outside money and the \$5,000,000 for last year's crop was that much new money put into circulation in the Territory, and that divided among a large number of people, as the receipts for cotton go largely to the great army of pickers. Cotton picking for several months each fall offers remunerative employment to boys and girls and every laborer in the Territory, and hundreds of bales went to waste last fall because of the shortage of pickers.

Oklahoma last year shipped whole train loads of cotton to Liverpool and large consignments went to Japan. The cotton crop not only brings ready money to the farmer and the laborer, but opens up great possibilities to the Territory in the starting of compresses and oil mills and later of cotton-spinning mills, where the fleecy staple will be made into cotton cloth here where it is grown.

HAY.

The Territory last year marketed thousands of tons of prairie hay in addition to supplying the home market. This year the abundant rains have caused a luxuriant growth of grass in every portion of the Territory and the hay crop is twice as great as in any previous year. So rich is the carpet of native grass here that raw prairie land will year after year net a handsome revenue from hay without the land being touched or a cent of expense incurred except in cutting and marketing the product.

Many of the tame varieties of grass do well, including timothy, millet, and alfalfa. Many farmers are having remarkable success with alfalfa both for hay and as a pasture for hogs.

KAFIR CORN AND CANE.

Kafir corn, a native of Africa and but little known throughout the country, has been found to grow and yield abundantly in any kind of ground and in the dryest seasons, and is planted largely for feed, as it produces from 50 to 75 bushels of grain to the acre in addition to the fodder. It can be planted early or late on new or old ground and is the very best of feed for cattle, horses, hogs, and poultry. The grain, which somewhat resembles a grain of rice, makes also excellent meal and flour.

The crop last year was large, and it is planted heavily this year, particularly in the western part of the Territory. Cane yields enormously, and is largely planted for feed, generally being cut with a mowing machine and dried for its rich fodder before maturing.

Fully 40,000 bushels of Kafir corn were exported from Oklahoma to European markets the past year, and there is a rapidly increasing foreign demand for this new product.

OKLAHOMA MELONS.

It is no uncommon sight to see a 75-pound watermelon in Oklahoma, and any time between July 15 and cold weather an Oklahoma man can get as large a melon as he cares to carry for a nickel. Last year the Territory shipped over two hundred cars of melons; this year the crop is much larger. Every condition for the growth of perfect melons has existed this year. The only trouble last year was a second growth in some fields, caused by unusually heavy rains, a rather dry spell, and then more rain. This made our melons rate a little low in quality. The rains this year have been timely, the weather hot, and not a pest of any kind has attacked the vines. They will be sent to market as far north as St. Paul, east to St. Louis, west to Denver, and south to Texas, and should net the producer from \$40 to \$50 a car. The Oklahoma melon is noted not only for its size but for its excellent flavor, and is everywhere in demand.

Cantaloupes also grow to perfection here, and all during the season hundreds of baskets go out daily by express.

OATS.

Oats do as well in Oklahoma as anywhere else in the country. Many yields of 75 to 85 bushels per acre are reported and the general average over the Territory is fully 45 bushels and the quality excellent.

CASTOR BEANS.

Experience has proven castor beans a very profitable crop for most parts of the Territory. They yield from 10 to 14 bushels per acre, and entail but a small amount of labor. The market price is usually from 90 cents to \$1 per bushel. Last year the Territory produced 175,000 bushels. This year the acreage is less, and the crop will not run quite as large.

OTHER PRODUCTS.

There are many other products of Oklahoma farms finding their way into market. Early potatoes yield largely and are shipped all

over the North. Sweet potatoes produce 200 bushels and upward per acre, of an excellent quality. Peanuts do well and are largely planted.

Turnips grow everywhere and produce enormously, and sugar beets yield 15 tons and upward per acre.

Oklahoma broom corn is favorably quoted in the markets of the nation, and flax and barley are produced to a limited extent.

Truck farming pays well in the Territory, as cabbage, tomatoes, beans, pease, onions, and all varieties of garden vegetables grow readily and bring profitable returns. Pumpkins and squash grow to enormous size, specimens being shown at the Territorial fair last fall up to 50 and 60 pounds. These mammoth products, together with 15-pound heads of cabbage, were brought from D County, in the western part of the Territory, where many misinformed people believe it is too dry to grow successful crops. The truth, however, is that these western counties have an abundance of rain in the growing season, and produce as desirable crops as any portion of the Territory. In fact, from an agricultural point of view, Oklahoma knows no north, no south, no east, no west, the whole Territory being fertile and productive, and the farmer has only to suit his selection of crops and time and manner of planting to his particular locality and combine with horticulture or stock raising to be uniformly successful and prosperous.

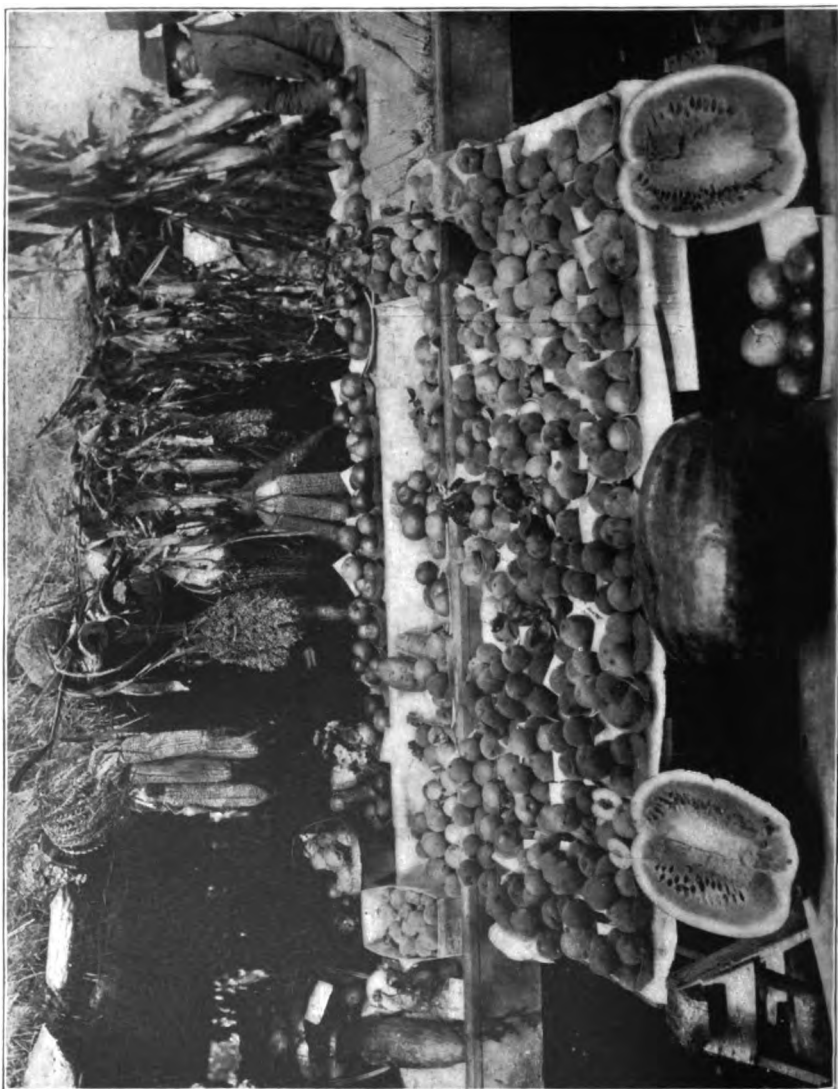
STOCK RAISING.

Oklahoma is the ideal stock raisers' country. Here are vast plains, carpeted with rich grasses the year round, alongside of fields of grain and fodder, long summers and short mild winters, and immunity from many of the diseases of domestic animals.

Aside from the possibility of infection of cattle with southern or Texas fever (and the quarantine laws now in force greatly reduce this danger), and the fact that hog cholera caused considerable loss in some parts of the Territory, the year was a prosperous one to all classes of breeders and feeders of good stock. The assessors' returns for the spring of 1898 show the following numbers of head of live stock in the different counties of the Territory:

County.	Horses.	Mules.	Cattle.	Hogs.	Sheep and goats.
Beaver	6,202	337	64,340	496	16,975
Blaine	4,541	700	5,538	2,483	168
Canadian	7,794	1,639	15,013	7,425	88
Cleveland	6,921	2,529	7,736	12,974	64
Custer	5,596	944	22,872	4,324	86
D	3,968	573	18,771	3,282	102
Day	1,643	159	17,254	458	4
Garfield	11,412	1,880	21,869	20,270	718
Grant	11,128	1,580	15,809	20,941	88
Greer	14,903	2,008	54,868	3,282	14,448
Kay	11,258	1,756	16,157	20,676	967
Kingfisher	9,867	1,854	15,015	8,937	40
Lincoln	11,697	3,230	11,998	17,568	432
Logan	9,514	2,367	11,558	14,711	165
Noble	6,182	1,151	41,487	11,755	.....
Oklahoma	8,608	2,285	9,718	14,090	.....
Pawnee	9,285	1,928	107,456	23,259	190
Payne	9,956	2,852	13,689	22,865	118
Pottawatomie	10,508	3,408	14,083	11,590	145
Roger Mills	4,752	492	29,594	1,015	2,647
Washita	7,912	2,809	33,568	5,499	215
Woods	21,824	2,957	59,599	28,063	2,200
Woodward	5,607	359	50,790	1,492	958
Kiowa and Comanche	2,896	85	118,109	300	12,100
Total	203,974	38,897	775,851	257,740	52,968

a In the figures for Pawnee County are included live stock in the Osage Reservation.



FRUIT DISPLAY AT MONTHLY MEETING OF OKLAHOMA COUNTY HORTICULTURAL SOCIETY.

The chief interest of much of the western part of the Territory is cattle grazing. In the eastern part there is room for many more cattle, and the cheap pasturage and cheap grain and rough forage for winter feeding are arguments in favor of increased attention to breeding cattle.

The Oklahoma Live Stock Association is one of the largest and most active associations of cattle and stock raisers and breeders in the West (representing \$4,000,000 worth of cattle), and their official paper, the Live Stock Inspector, one of the leading stock journals of the country. This association looks after the interests of its members by maintaining three special inspectors in the Territory and one in the Kansas City market, and its annual convention, held at Woodward the second Tuesday of February each year, is the largest annual gathering of stockmen in the Southwest and is the occasion of heavy trading and investment in live stock and ranches. Greer County also has an active live-stock association.

THE CATTLE INDUSTRY.

A general live-stock law, with provisions for the special protection and encouragement of cattle growers in the western part of the Territory, was passed by the legislature in 1897. Under this act the board of regents of the Territorial Agricultural and Mechanical College are constituted a live-stock sanitary commission, with authority to make and enforce rules and regulations governing the care of live stock, importation, shipment, quarantine, etc. The law provides for a force of three regular inspectors, the inspection of pastures, pens, and cars, and the examination of all cattle killed for domestic consumption, and under it a rigid system of inspection and protection has been inaugurated and the Territorial and Federal quarantine line maintained in every instance.

There has been comparatively little Texas or splenetic fever in the Territory the past year and all cases have been rigidly quarantined, so that Oklahoma cattle rank high in markets everywhere. The old methods of driving in great herds of Texas cattle to fatten on grass alone, and to look out for themselves in winter, is giving way to smaller herds, better cattle, winter feeding, and grain fattening.

Cattle are being bred up and improved in all parts of the Territory, and western Oklahoma has a number of fine herds of Herefords, Short Horns, and other blooded and grade cattle.

The live-stock sanitary commission has lately erected a dipping vat to thoroughly test the method of killing all ticks and removing danger of infection from Southern cattle by dipping in a solution of petroleum. If this method proves to be a success it will be worth hundreds of thousands of dollars annually to the farmers and stock raisers of the Territory. There are large areas in western Oklahoma not suited for agriculture, but which are admirably adopted to cattle grazing, and the owner of herds upon these lands reaps remunerative returns year in and year out.

A law passed at the last legislature allowing live stock to be brought into the Territory for winter feeding, without being subject to taxation, will be the means of bringing hundreds of thousands of head of cattle and hogs into the Territory this fall and afford farmers a profitable market for all surplus grain and "roughness."

HOGS.

An examination of the reports of shipments by the railroads of the Territory, given under the head of commerce, will show that the ship-

ments, not only of cattle, but of hogs as well, have been enormous the past year and are increasing very rapidly. The farmers of every county in the Territory are more or less engaged in hog raising, and many large ranches in the wooded sections contain thousands of the animals. Special breeders are introducing highest grades of stock in all parts of the Territory. The eastern counties are the most largely engaged in this industry, and by the feeding of alfalfa, or allowing the animals to run in the woods and feed on nuts, the cost of raising is reduced to a minimum.

OTHER LIVE STOCK.

The breeding of fine horses has not as yet been largely followed in Oklahoma, though several Eastern men have bought lands to establish large horse ranches, declaring that the Territory was admirably suited to the production of speed animals.

Oklahoma has already produced many horses with fine track records, and the native horses are being gradually improved.

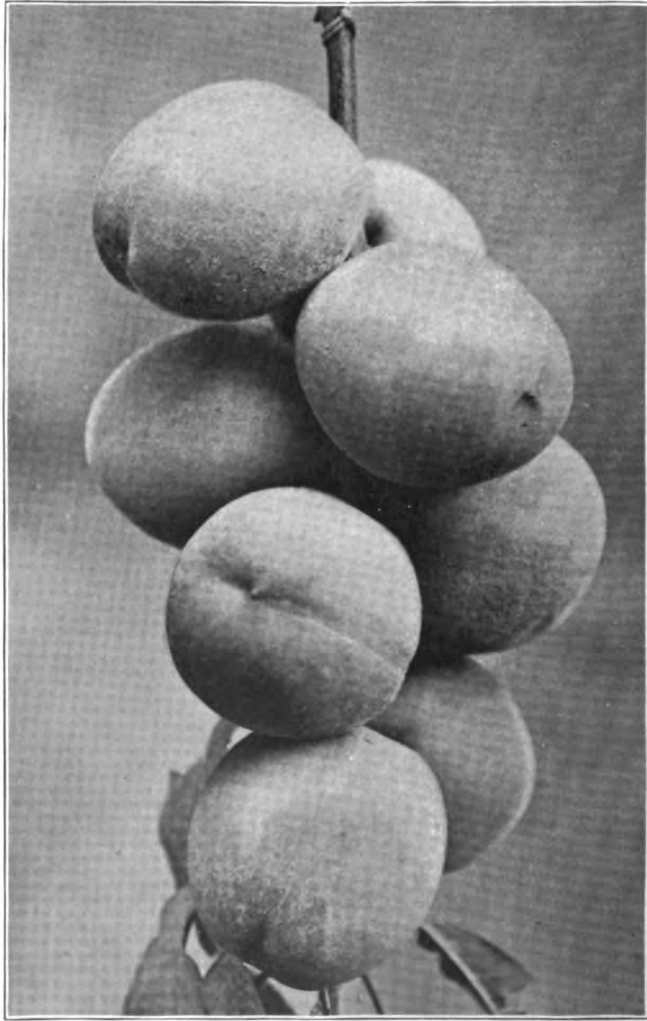
The proper conditions exist in the Territory for the profitable growing of sheep and wool, but outside of Beaver and Greer counties but little has been done in this line.

Poultry do exceedingly well in every part of the Territory, and the shipments of live and dressed poultry and eggs is quite large from some stations.

HORTICULTURE.

Oklahoma bids fair to rank in the very near future as one of the great fruit-growing sections of the continent. Though her orchards and vineyards in the comparative short history of the Territory have as yet been unable to give much more than an indication of what the permanent results will be, enough has already been demonstrated to show that as many varieties of fruit will succeed here as at any other point in the United States, and there can be no further doubt of the complete success of fruit growing in the Territory. Upon every farm are planted orchards covering from 5 to 20 acres, and hundreds of farmers are devoting 40, 50, and more acres to fruits and vines. The assessor's returns show an almost incredible number of fruit trees planted in some counties, and still on every side the planting continues. The best varieties of all fruits are being planted, and every grower is experimenting for the fruits best suited to the climate and soil. At the Oklahoma experiment station, connected with the agricultural college at Stillwater, 100 acres are devoted to experimenting with every variety of fruits to determine those best suited to the Territory, and an idea of the work being done there and its great value to the Territory can be obtained from the following extract from a brief report of the station work made by Horticulturist Glazier:

The large fruits, as contradistinguished from vine fruits, occupy the major portion of the grounds. There are 255 varieties of apples, of only three trees of a variety. The setting of this orchard was commenced in April, 1892. Among this great variety it is to be expected that very many will prove to be not only shy bearers but shy growers. The first fruit of the apple was produced from this orchard this year, showing some very nice samples. Of peaches we have 75 varieties, the famous "Alberta" leading the list. There are 25 varieties of pears—the Keiffers, Bartlett, Douches, and Garber lead. Also 25 varieties of plums, the Chickasaw varieties being the most productive. Of seven varieties of cherries, the Early Richmond, English Morelo, and Montmorency are the only ones that have shown to be of any value. Quinces and nut trees are showing some progress. One dozen apricot varieties, owing to location, have not fruited satisfactorily, or shown any special value. Apricots on proper altitudes have proven to be fruitful and profitable in the Territory. This country



**ELBERTA PEACHES CUT FROM TREE THREE YEARS OLD, NOBLE
COUNTY. WEIGHT OF CLUSTER 55 OUNCES.**

might very properly be called vine land, for in no other country can be found a larger variety of native grape fruit. We have 300 varieties of two and three canes each. We are growing the Northern Fox Grape (*Vitus labrusca*) by the side of the Sand or Rock Grape of western Mississippi Valley and Texas (*Rupestris*), and the Lincecumii or Post Oak. Many of our varieties are valueless here, but the majority show both remarkable growth and fruiting. About 30 varieties of strawberries were grown. The major portion were very prolific, and by selecting varieties our season extended fully six weeks. That the strawberry can be grown at a profit in this Territory there is an abundance of evidence; they are money makers, and should be so recognized. Out of 10 varieties of blackberries 2 have proven to be worthy of any man's trial, the Early Harvest and Kittatinny. The raspberry may be said to be a poor fruiter here, owing to an insufficiency of humidity at fruiting time. The dewberry is a winner, and comes on early. Of some of our varieties 55 berries will make a quart.

In Oklahoma's car of exhibits, sent through the North and East last year, apples, peaches, apricots, plums, pears, and other fruits were shown which were a surprise and compared favorably with the fruits of any portion of the United States, and the samples shown at the Omaha Exposition this year far eclipse those from many old fruit-growing sections. An idea of the value of the fruit crop of the Territory to the people last year, outside of the return for shipments out, is shown by the fact that from 6,000,000 to 8,000,000 fruit jars were sold in the Territory for putting up fruits for home use, insuring more wholesome food for the people and keeping in their hands the money that had gone to buy outside canned goods before the fruit crops materialized here. The assessors' returns for the year 1896, although very incomplete, show the following number of fruit trees in each of the counties of the Territory:

Number of fruit trees in the Territory.

County.	Number of trees.	County.	Number of trees.
Beaver	25,422	Logan	220,329
Blaine	252,666	Noble	216,408
Canadian	186,097	Oklahoma	220,941
Cleveland	162,256	Pawnee	198,707
Custer	91,975	Payne	559,737
D	37,181	Pottawatomie	319,235
Day	9,235	Roger Mills	11,708
Garfield	661,163	Washita	98,993
Grant	460,732	Woods	467,442
Greer	76,694	Woodward	(a)
Kay	(a)	Total	4,648,151
Kingfisher	87,704		
Lincoln	403,526		

a No report.

OKLAHOMA PEACHES.

Oklahoma peaches were favorably known on the market of the nation last year. Hundreds of cars were shipped to the cities of the North and many even went into the fruit belt of Texas and the South. The yield last year was almost beyond belief, and peaches 9 and 10 inches in circumference and weighing 8, 9, and 10 ounces were very common. Peach trees begin to bear at four years of age in Oklahoma, and I personally know of one tree bearing half a bushel of peaches when but two and one-half years from the seed. Five successive crops have been gathered from orchards that have been planted above the late frost line in spring, and the fruit is not surpassed anywhere east of the Rocky Mountains in size, flavor, and color.

Owing to an unprecedented freeze from a blizzard which swept over the whole country last spring after the peaches here were well formed, the peach crop will be short this year.

APPLES.

Those varieties of apples which have been found adapted to this climate are doing remarkably well. For the first time last year our home markets had a liberal supply of Oklahoma apples, large in size, excellent in flavor and keeping qualities. This year the crop will be large, as all bearing trees are loaded. In a few years, when the orchards generally reach a bearing age, Oklahoma will be shipping apples to all parts of the United States.

GRAPE CULTURE.

The vineyardist can find no better location in the United States than in Oklahoma, whether he intends the growing of grapes for the markets or the manufacture of wines. Grapes grow to perfection in Oklahoma and produce abundant crops three years from the cutting, and will continue to bear every year for a generation and longer. T. V. Munson, of Texas, one of the noted grape experts of the country, after a careful examination of Oklahoma vineyards, soil, etc., said, in closing an exhaustive treatise on grape raising in the West:

It appears that there is abundant material of best character, which will find in the intermediate location of Oklahoma, with its mild, healthful climate and congenial soils, its place for best development and profitable cultivation. Altogether Oklahoma occupies the ideal climate and contains the ideal soils for most successfully growing, for either table or wine, a greater range in varieties than any other equal area in the United States, save a similar region in central northern Texas, adjoining Oklahoma and materially forming a part of this superlatively fine grape belt.

Grapes grow anywhere in Oklahoma and yield good returns with almost no care or attention, but when properly pruned, cultivated, and cared for the yield is remarkable and the profit correspondingly great. Concords yield 25 pounds and over to the vine and other varieties accordingly.

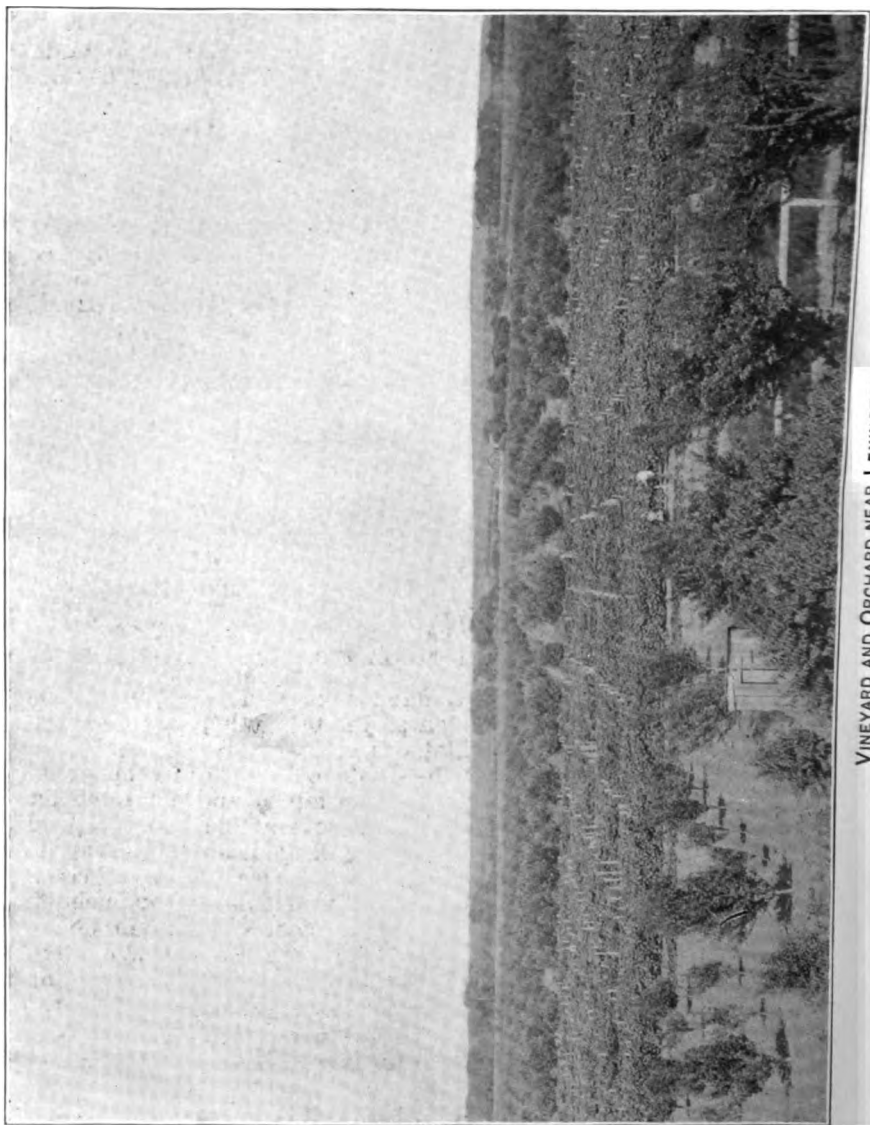
The fruit grows in immense bunches which ripen evenly with no stung grapes or mildew and, coming into maturity from July 15 to September 15, reach the markets ahead of the Northern grape and just after the Southern. Wine can be made without sugar from Oklahoma grapes and be almost as sweet as Northern wines made with sugar, and the wine made in Oklahoma matures a year earlier than that of the North. The rapid growth of the grape here is almost phenomenal. Instances are known of vines making a growth of 30 feet or over in a single season, and many cases are reported of vines bearing liberally the second year from the cutting. Thousands of acres are now in bearing vineyards in Oklahoma, and thousands of gallons of wine are being made annually, and there are great possibilities in the Oklahoma grape crop as yet almost unthought of.

PLUMS.

Oklahoma is the natural home of the plum. The native varieties all do well, but the most remarkable results have been obtained from the Japan varieties, such as Abundance, Burbank, Satsuma, etc. They yield the second and third year from planting and the limbs are borne to the ground with the immense quantities of fruit. In a few years Oklahoma will be supplying the markets of the nation with the finest of plums.

BERRIES.

Many kinds of berries do well in Oklahoma and the acreage devoted to them is large and constantly increasing. The luscious strawberry



VINEYARD AND ORCHARD NEAR LEXINGTON.

grows to perfection here. Berries 5 inches in circumference are very common and many are seen over 6 inches. They ripen early, yield largely, and have the finest flavor. Some varieties of raspberries do well and blackberries grow to perfection and produce phenomenal yields. The Juneberry, dewberry, and Japanese wineberry all do well, and berry culture bids fair to become an important branch of Territorial horticulture.

OTHER FRUITS.

Cherries do exceedingly well and, though slow to bear, those orchards which have reached fruitage are paying handsome profits. All varieties seem to thrive, but the Richmonds are in the lead.

German prunes yield well, and figs and almonds have been grown to maturity.

IRRIGATION.

Rain has been so abundant in all parts of Oklahoma the past few years that the subject of irrigation has been somewhat neglected. The Territory has full and complete laws on the subject, but as yet there has been no general irrigation movement. In Beaver County an extensive ditch has been constructed and a considerable body of land made more largely productive, and here and there over the Territory plants of some magnitude have been established, while thousands of farmers irrigate small tracts by water pumped from wells or streams or gathered and held in ponds, and all find that even in most favorable seasons water at command to turn in upon berries or vegetables at the right time more than pays all the cost.

The abundance of water in streams, the easy construction of ponds or reservoirs, and the ready supply of water in wells everywhere over the Territory make irrigation easy and cheap, and the strong indications of artesian water in various localities offer inducements for a fuller investigation of the subject.

MINES AND MINERALS.

While there are indications of valuable mineral deposits in various parts of the Territory there has been as yet but little practical development of mineral resources of Oklahoma.

There is no longer any doubt of the existence of coal in commercial quantities in the Territory. Coal has been mined and marketed for over a year at Ralston, Pawnee County, and several fine beds of a good quality of soft coal are known to exist in the Osage Indian Reservation. There are also outcroppings veins in eastern Pawnee and Payne counties, and two good veins have been struck by well drillers near Cushing. There are outcroppings in Lincoln County, near Orlando in Logan County, and in the Kiowa and Comanche Reservation, and a lump of coal weighing 2,500 pounds, from Pottawatomie County, is attracting much attention at the Omaha Exposition, being a surprise even to the visitors from the Territory. There are rich deposits of coal all along the Creek Reservation line, and the Choctaw Railway is supplying thousands of tons of the best coal from its mines in the Indian Territory.

There are immense cement deposits in the Territory, which are just beginning to be utilized. A large cement works has lately been established at Okarche, on the Rock Island, and one at Newkirk, on the Santa Fe, which are supplying all the home trade and shipping largely to other States.

There is enough gypsum in deposits and great rocky heaps in Blaine County to supply the United States with plaster for years.

The salt deposits of the Territory are great in extent, and Oklahoma can easily supply the great West with all her salt. In the saline reserves thousands of tons of almost pure salt are in sight on top of the ground, and at many places there are rich deposits of rock salt at a depth easily reached.

Deposits of iron, copper, zinc, and other minerals, including many kinds of clays, undoubtedly exist in the Territory, but as there has as yet been little or no attempt to mine them they are more properly spoken of under the head of undeveloped resources.

UNDEVELOPED RESOURCES.

Oklahoma is rich in undeveloped resources, and in time her mining and manufacturing interests will make her an important factor in the commercial life of the nation. With rich deposits of minerals of various kinds, with agricultural and live stock interests so prosperous and progressive, there is a ready field waiting development by the wheels of industry.

Little mining has been done in the Territory, but a rich harvest awaits the miner. Veins of good coal have been found in several counties, and there are undoubtedly others still unlocated. In the Wichita Mountains, in the southwest part of the Territory, are mountains of iron, while copper has been found so nearly pure as to be malleable. There are strong indications of zinc at a number of points, and both gold and silver have been profitably mined at Navajo, Greer County, while across in the Kiowa and Comanche country are ruins of abandoned Mexican or Spanish silver mines, and many prospectors declare that gold exists in the reservation in large quantities, though the assays of samples do not pan out according to their claims. In this same reservation are large deposits of asphaltum and several oil springs. The Territory is well supplied with a variety of building stone, and in many counties it is so plentiful and so easily quarried as to make stone buildings remarkably cheap. Various kinds of limestone, sandstone, and granite are included, and in the western part of the Territory is found a remarkable soft blue stone, having almost the qualities of common soap. Beds of fine clay, potter's clay, and paint clay are found over the Territory, and in every locality is excellent clay for ordinary building brick.

On the great saline reservations in Woods and Woodward counties there are many places where for miles the ground is covered with salt, stretching in a dazzling, blinding whiteness as far as the eye can see, and for generations the Indian tribes of the West have been making pilgrimages to these lands to secure a supply of salt. Pure salt can be shoveled up with a scoop shovel at many places. The Salt Fork and Cimarron rivers, after flowing through these great salt marshes, are made as bitter as the ocean, and salt wells can be easily drilled any place thereabouts. In Blaine and Greer counties and the Kiowa and Comanche reservations there are deposits of rock salt. Salt is being manufactured for the market at Salton, Greer County, and Okeene, Blaine County, and there are many possibilities for great industries when transportation shall be secured. Salt Creek, in the latter county, heads in remarkable formations of rock and mineral, where there are numerous evidences of a great upheaval of nature. Here are a number of natural bridges across great ravines and chasms, and seeping up

from great deposits of rock salt is a constant flow of brine which forms Salt Creek, one of the most remarkable streams on the continent, the water of which will yield 50 per cent of its weight in pure commercial salt when evaporated.

All of these resources offer a great field for development, yet it is in the factories and other industries contingent upon agriculture and horticulture and stock raising that the Territory offers the richest field. Enough hogs are now shipped out of the Territory to run a large packing establishment, and enough bacon, hams, and other meat products shipped in to give them a home market for most of their products.

The tons upon tons of hides now shipped out should be tanned here and the product manufactured into shoes. Every town of any size has one or more flouring mills, yet there is room for more.

In the great fruit and vegetable yield are almost unlimited possibilities for canning, preserving, and pickling establishments, while the immense cotton crop offers a field for compresses and oil mills, and invites a cotton mill or two for the manufacture of this staple into wearing apparel. Creameries are proving profitable and many more are needed, while the remarkable success of grape culture invites the manufacturer of wines. These are but a few of the most inviting fields now open in this rising young Commonwealth, and the man who takes advantage of these opportunities will be carried forward to success in the swiftly-developing progress of the Territory.

OIL AND GAS.

There has been much speculation the past year or two as to the existence of either oil or gas in paying quantities in the Territory. Several years ago the Government put down a well for water at Fort Reno, going 1,326 feet in depth and finding no traces of either oil or gas. A well put down at Pawhuska a year ago struck some oil, but was immediately sealed up, the drillers declaring that the yield was too small to make it pay commercially. It is a significant fact, however, that the company that put down this well afterwards leased large tracts of land in the Osage Reservation and in Pawnee and Payne counties. At Bartlesville, just over the line in the Indian Territory, oil of an excellent quality has recently been struck in paying quantities, and at Muskogee and Eufala, in the Creek Nation, several paying wells have lately been drilled.

In the Chickasaw Nation, south of central Oklahoma, and in the Kiowa and Comanche Reservation are springs strongly impregnated with petroleum, and large deposits of asphaltum are also found in that vicinity, being the residue of former deposits of oil thrown up in the upheaval of the broken mountains in that section.

The finding of gas and oil northeast of here in Kansas and along the eastern line of the Territory, coupled with the fact that oil and gas fields always trend in a belt running from northeast to southwest, leads us to believe that both gas and oil can be found in paying quantities at least in central and eastern Oklahoma.

A company is now forming at Guthrie to put down a test well 2,000 feet deep.

Secretary Givens, of the Muskogee Gas and Oil Company, in response to my recent request as to the success of their operations, wrote as follows:

Your letter of the 25th instant to the editor of the Muskogee Times, in which you request information in regard to the developments which have been made for oil and gas in the Indian Territory, has been handed by him to me for reply.

I have the honor to state that I hold the position of secretary of the Creek Oil and Gas Company and the Muskogee Oil Company, both of which companies have headquarters at Muskogee. These companies are organized under the authority of the Creek Nation and to them has been granted the exclusive right to prospect for and develop oil and natural gas within the limits of the Creek Nation. In the winter of 1896 and the spring of 1897 the Creek Oil and Gas Company caused two wells to be drilled within the limits of the town of Muskogee, and in each of these wells, which are located in the same part of the town, oil of an exceptionally fine quality was found. It is of a reddish-green color, and in quality has been found to be second only to the best oils in Pennsylvania. I have to-day forwarded to you by express a small sample of this oil, which is in the same condition as when it was withdrawn from the well a few days ago.

In drilling these wells an oil sand was encountered at about 700 feet, and another, which is the one being operated, at a depth slightly in excess of 1,100 feet. The drilling was continued until salt water was encountered at a depth of about 2,000 feet. The sand in which the oil was found is of a whitish color. These wells yield a small quantity of natural gas. Owing to the unsettled condition of affairs in the Indian Territory, and the absence of a market, these wells have not been pumped steadily, but when pumped they have each produced about twenty-five barrels per day. Preparations are now being made for an extensive development of that part of the Creek Nation which is contiguous to Muskogee. At Eufala, Ind. T., the Muskogee Oil Company has caused a well to be drilled to the depth of about 2,500 feet; it is not yet completed, but both gas and oil, similar to that found at Muskogee, have been encountered in small quantities. It is the intention of the Muskogee Oil Company to cause considerable development to be made during the present year in the territory which is adjacent to Eufala.

I am informed that oil in considerable quantities, of a quality similar to that found in Kansas, has been found in a well which has been recently drilled at Bartlesville in the Cherokee Nation by the Cudahy Oil Company of Chicago, Ill. The Creek Nation has been examined by an experienced geologist, representing English capitalists, who has reported favorably with reference to the existence of oil and gas in the Nation.

THE ROCK STRATA.

When the well was drilled at Fort Reno, a complete record of all rock strata passed through and deposits encountered was kept, which is of special interest to all interested in gas, oil, or artesian-water development. The record is as follows:

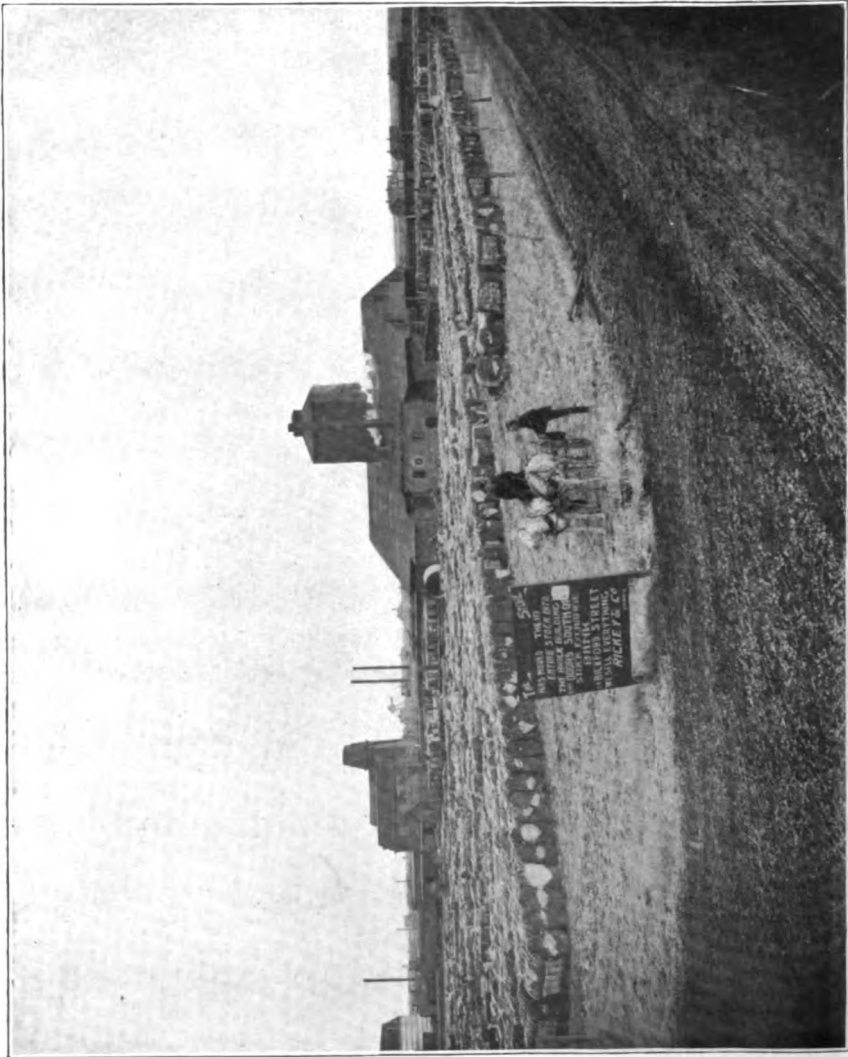
Rock strata, etc. found in boring artesian well, unsuccessfully, at Fort Reno, Okla.

	Feet.		Feet.
Soil and clay.....	20	Shale	29
White sandstone.....	4	Sandstone.....	47
Red shale and gypsum.....	146	Shale	53
Gypsum.....	2	Granite (or bowlder)	13
Red sandstone.....	7	Light red sandstone.....	24
Bird's-eye keel	76	Red shale	30
Sandstone.....	3	Red sandstone.....	6
Redstone.....	67	Bird's-eye keel	20
Soft red keel (salt water raised 200 feet)	6	Red shale	43
Red shale.....	110	Light red sandstone.....	9
Opening (fresh water raised 325 feet)	3	Red shale	217
Red and sandstone.....	20	Bird's-eye keel	80
Red shale.....	200	Red sandstone.....	10
Light red sandstone.....	23	Red shale	26
Shale	17	Red sandstone (work stopped).....	6
Coarse sandstone.....	9		
		Total	1,326

NOTE.—Sea level about 1,370 feet.

MANUFACTURING.

In a commonwealth built up from the virgin soil in eight years it can not be expected that manufacturing industries will have been developed to any great extent, and yet the advance made in this line in



COTTON COMPRESS AT EL RENO.

Oklahoma is really a surprise to even those accustomed to the rapid growth and upbuilding of Western communities.

There are in the Territory at this time twenty-two flouring mills, several with a capacity of 400 barrels per day, whose aggregate output is over 3,000 barrels per day, and a number of additional mills are in contemplation.

El Reno, Shawnee, and Tecumseh have cotton compresses in operation and one is being constructed at Oklahoma City. Norman has had a cotton-seed-oil mill in operation several years and plants for similar mills on a larger scale are being put in at Oklahoma City, Shawnee, and Guthrie.

There are large ice and cold-storage plants at Perry, Ponca, Guthrie, Oklahoma City, Shawnee, El Reno, Kingfisher, and Enid, and profitable canning factories at Guthrie, Oklahoma City, and Augusta.

There are a hundred or more cotton gins in the Territory, the principal towns having from one to six each.

Salt is manufactured in Greer and Blaine counties, and there and elsewhere in the Territory are possibilities of great salt industries.

Large stone quarries are operated in every county, Blackwell and Shawnee have pressed-brick factories, and good brickyards are operated in every town. At Okarche, Newkirk, and Stroud are cement works and at Shawnee are located the general repair shops of the Choctaw, Oklahoma and Gulf Railway, employing 125 men.

Creameries are being successfully operated at Oklahoma City and El Reno, the latter shipping the greater part of its butter product directly to the City of Mexico. Perry, Enid, Alva, and Medford will put in creameries the coming year. Cheese factories are in operation at Perkins and Orlando, and considerable cheese is manufactured at other points.

Shawnee, Oklahoma City, Guthrie, El Reno, Perry, Ponca, and Enid have both machine shops and planing mills, and Oklahoma City a large sash and door and blind factory. Oklahoma City and Guthrie have carriage factories, and in all the principal towns harness is manufactured.

Excellent wine is being manufactured on a rapidly growing scale, and in Oklahoma County are several large wine vats and cellars.

There are also in the Territory a score or more of cigar factories, several broom factories, a dozen bottling works, and many other small industries, in addition to the electric light, power, and water plants more properly enumerated under the head of cities.

The ready market for products, the cheap fuel, and the rapid growth and development of this country makes it a very desirable location for the establishment of small manufacturing industries to build up and grow with the country. It is only a question of a few years until Oklahoma will have many large manufactories turning out leather, harness, shoes, cotton goods and clothing, vehicles and implements, canned goods and preserves, brooms, and the many other articles demanded by the great army of consumers in the Territory, and which can be advantageously manufactured here.

FUEL AND LUMBER.

The eastern part of the Territory is well timbered, supplying an abundance of fuel and cheap native lumber for building, while along the Indian Territory line is considerable timber suited to the needs of manufacturing. In the central and western portions timber is found along the streams and in the rougher sections, but there are some large areas

without native timber or fuel. The close proximity of the large coal fields of the Indian Territory and the lumber regions of Texas, Arkansas, and Louisiana gives to the entire Territory cheap fuel and lumber.

LABOR SUPPLY.

Few persons are without employment in Oklahoma, except from choice. The reports of the Territory's prosperity has caused a great influx of tramps and beggars from the States of the North and East the past year, but our own people are all busy and the newcomers who really desire work can readily obtain it. The opening up of many new industries in the towns, the construction of many new buildings, and the building of new railways have made a demand for mechanics, artisans, and laborers, while the bountiful harvest of wheat, the great yields of corn and cotton have made the demand for farm laborers in excess of the supply most of the year. Hundreds of bales of cotton went to waste last fall because of the scarcity of pickers, and the supply of competent domestic help is never equal to the demand.

Industrious men and women will at all times find in Oklahoma a good place to locate and will never be long without profitable employment.

PUBLIC HEALTH.

The happiness of all people is so closely associated with their health, that aside from the financial prosperity of our citizens, we would call attention to the efforts being made to resist the invasion of disease from without, and its development within, our Territory.

NATURAL CONDITIONS.

Nature has placed our people in the lap of health and it is only gross violation of her laws that with us brings disease. Situated between the extreme winters of the North and the enervating summers of the South, with an altitude that forbids the extension of malarial conditions on the one hand and serves as well to ward off pulmonary diseases on the other, our people have from the first enjoyed a degree of health which has been of wonderful value to them in the arduous labors of developing comfortable homes for themselves in a new land.

The temperature of our days in summer is no higher than that of many northern States, and our nights are a delight as they are ever made refreshing by the constant southern breezes that bless our people after a day of toil. Our Territory is free from swamps and lagoons where lurk the dread fever germs, and the gentle undulation of our land gives excellent natural drainage to our country as well as to our cities and towns. Pure cool water is found in nearly all parts of the Territory in a substrata of sand or sandstone, varying in depth from 20 to 100 feet.

Nature has done for us so much here in Oklahoma that if her laws were obeyed the work of the doctor and sanitarian would have little place among us, but with our great influx of population we must say with the poet—

“Though every prospect pleases,
And only man is vile,
In vain with lavish kindness
The gifts of God are strown.”

SANITARY LAWS.

On December 25, 1890, the act to establish a Territorial board of health went into effect, since which time no legislation has changed or modified the same. This act gives to health authorities power to supervise and enforce sanitation equal to that of most, and in fact superior to many, of our older States. The law provides for the maintenance of county boards of health, with an executive officer in charge, whose duty it is to report monthly to the Territorial superintendent of public health.

MEDICAL PRACTICE.

In order to prosecute the practice of medicine lawfully, a physician must be a graduate of a reputable medical college, of good moral character, and secure from the Territorial superintendent of public health a certificate showing such qualification, and giving to the applicant the right to practice.

Undergraduates can come before the Territorial medical examining board, and, if found qualified, secure from this board a similar certificate to that mentioned above.

Seven hundred physicians have secured certificates under the first-mentioned method; 104 of this number were granted certificates during the last year; 64 persons have been granted certificates by examination; 15 of this number being issued during the year past; total number of certificates issued, 764. Of this number of physicians who have secured certificates there are now residing in Oklahoma less than 325, or less than 1 physician to 1,000 of our population. Of this latter number many own farms and are not engaged in active practice.

This indicates two things—(a) that the medical profession is not suffering from severe competition; (b) that our citizens do not require the services of the doctor, as do many less-favored localities. Only two States and two Territories in the Union have as few physicians in proportion to their population as has Oklahoma; these are North Carolina and Wyoming, New Mexico and Alaska.

In seven States the ratio of the physicians to population is less than 1 to 500. Owing to our excellent medical laws, which from the first have kept out a class of charlatans that have been a curse to many another community, the qualifications of our physicians have been of an exceptionally high order. Constantly there have come to the office of the superintendent of health communications from illiterate, ignorant men, signing after their names "M. D.," asking if our medical laws would admit them to practice in Oklahoma. Fortunate are we that this class have found no foothold among us, but that rather our laws have been the means of giving us so excellent a class of medical men.

MONTHLY BULLETIN OF HEALTH.

About one year ago the Territorial board of health began the publication of a Bulletin of Health, the object of which was to disseminate sanitary information throughout the Territory and instruct our people in the laws of health. This publication has been a wonderful success along the lines of work desired. It was received from the first with great favor, and many flattering letters have been received both from the medical profession and citizens at home, as well as from eminent sanitarians from other States, in praise of the able manner in which our publication was presenting in a lucid way matters of vital importance to the health of the Territory.

This bulletin of health has been the means of awakening an interest in hygienic conditions among our people that has never heretofore existed. It is predicted that under the present board of health, every member of which is exhibiting a deep interest in the welfare of our people, Oklahoma will in the near future be behind no State in the sanitary condition of her towns and cities, and in the protection of her entire people from the ravages of diseases that can be prevented. With our magnificent climate, favorable geographical location, and with the financial prosperity which is already ours, there is no reason why many broken in health in less favored climes should not seek homes with us.

TRANSPORTATION OF THE DEAD.

Regulations will go into effect September 1 that will require the licensing by the Territorial board of health of all undertakers and embalmers who desire to ship bodies dead from contagious diseases to other States. This provision has been long desired by the employees of the transportation companies, who have often been exposed to great danger.

This regulation will also lessen the danger of the spreading of contagious diseases at the point of receiving such bodies. An extract from a letter received from the general baggage agent of the Atchison, Topeka, and Santa Fe Railway system, Mr. P. Walch, says: "I thank you for your very kind interest in this matter, and only wish that some of the older States would take as prompt action."

HOSPITALS.

It is a great pleasure to notice that plans are being perfected to establish hospitals in different parts of the Territory. These will be of much comfort to those who require special treatment, and to many who have only a temporary home among us. In fact, as we come to fully know the value of well-managed hospitals, no one will be reluctant to avail themselves of the advantages of these institutions, but will consider it a privilege when suffering from disease to receive the intelligent care administered to the sick in these institutions.

PUBLIC INSTITUTIONS.

An inspection of our three Territorial colleges, the Territorial normal school at Edmond, the agricultural college at Stillwater, and the university at Norman shows them to be in good hygienic and sanitary condition. These school buildings have excellent locations from a sanitary point of view, and are well ventilated and heated by approved systems. The buildings and grounds are kept in hygienic condition, and the health of the pupils attending last year was excellent. No epidemics of contagious or infectious diseases have visited any of our public institutions.

The insane asylum at Norman, although under private management, is a well equipped institution. During the past year many expensive improvements of a sanitary nature have been made.

New sewerage has been constructed, which is a decided improvement over the old system. A private water supply has been put in service, and the institution now has pure, clear water. The buildings have also been screened entirely, which has added to the comfort as well as to the health of the inmates. We imagine that there are few superior

private institutions for the care of the public insane, that are maintained with a view of giving comfort and proper hygienic surroundings to the inmates, than our institution at Norman.

PROGRESS.

Much advancement has been made along the lines of sanitary work during the past year. For the first time systematic county reports from county superintendents of health have been made. These reports have been complete and valuable, and county health officers have, in most instances, been faithful to their trust, although oftentimes at a personal sacrifice. Health laws have been vigorously enforced, and our cities and towns are in a better condition than ever before. The monthly reports of county superintendents of health show that Oklahoma has had less sickness than heretofore. Yellow fever last autumn was on our south and east, and the present spring smallpox has existed in numerous towns in many States, as well as in our neighboring States—Arkansas, Texas, and Colorado; yet we have been so fortunate as to escape.

THE FUTURE.

The appropriation made by the last legislature for the department of health was so small that much work that had been contemplated by this department was necessarily postponed, yet in the near future a number of reforms will be undertaken. A better inspection of food products will receive early consideration, and deleterious canned foods, adulterated food products, and other injurious foods will be kept from our markets. There will be presented to our larger towns cheap yet efficient methods of sewerage, which they will soon require.

PHARMACY AND DENTISTRY.

The sale of drugs and medicines and the practice of pharmacy are well regulated by legislative enactment, and a Territorial board of pharmacy appointed by the governor looks well after the enforcement of the law on the subject.

There are in the Territory at this time one hundred and fifty-eight registered pharmacists, and eighty-five general merchants located 10 miles or more from a registered pharmacist have been granted permits to sell certain common drugs, patent medicines, and bottled goods under regulations prescribed by the board of pharmacy. The druggists of the Territory are organized into an active pharmaceutical association which cooperates with the board of pharmacy in every way.

The practice of dentistry is fully regulated by Territorial laws requiring strict examinations under rules prescribed by a competent board of examiners appointed by the governor, and all persons attempting to practice without examination and license are promptly prosecuted. There are at this time fifty licensed dentists in the Territory.

THE PRESS.

From the first day of its existence, Oklahoma Territory has had the advantage of a progressive and energetic press, and it is largely to the untiring efforts of her newspapers and newspaper men that Oklahoma owes much of her progress and prosperity. Unceasingly have they sung the praises of this fair country, each loyal to his own community

or section, and yet all true to the Territory as a whole, and they do not only the thanks of the people of the Territory but a substantial patronage from every citizen.

Not only does the press compare favorably with that of any section of the country, but it is far ahead of most sections with same population, settlement, and patronage, and it speaks voluminously the intelligence and home patriotism of the people of the Territory; not only does every locality support a good local paper, but at the capital is published a full-fledged metropolitan daily, with full association press dispatches over a special leased wire, while four or five dailies in the Territory have during the war excitement been carrying a special telegraphic service.

There are published in the Territory at this time 14 dailies, 108 weeklies, 1 semi-monthly, and 10 monthlies, a total of 133 publications as follows:

Dailies.

Guthrie: Oklahoma State Capital, Daily Leader, Free Press.
Oklahoma City: Times-Journal, Oklahoman, News.
El Reno: Star, Bell.
Enid: Wave.
Shawnee: Dinner Bell, Chief.
Perry: Enterprise-Times, Democrat-Patriot.
Ponca: Courier.

Weeklies.

Beaver County: Beaver—Herald; Hardesty—Herald.
Blaine County: Watonga—Republican; Okeene—Eagle; Geary—Rustler.
Canadian County: El Reno—News, Democrat, Globe, Bell, Volksblatt (German); El Reno—Herald; El Reno—Herald.
Republican; Okarche—Times; Yukon—Weekly.
Cleveland County: Norman—Transcript, Voice, Democrat-Topic, Journal.
Cleveland County: Norman—Transcript, Voice, Democrat-Topic, Journal.
Custer County: Arapahoe—Bee, Argus.
D County: Taloga—Advocate, Times.
Day County: Grande—Tribune.
Garfield County: Enid—Eagle, Sun, Coming Events, News, Democrat.
Grant County: Pond Creek—Vidette, News; Jefferson—Rustler; Medford—Pioneer; Manchester—Journal; Wakita—Herald.
Greer County: Mangum—Star, Monitor, Sun; Altus—Plain Dealer.
Kaye County: Newkirk—Republican, News, Democrat, Populist; Ponca—Citizen; Democrat; Kildare—Journal; Blackwell—Times-Record, Sun; Nardin—Star.
Kingfisher County: Kingfisher—Free Press, Times, Reformer, Constitution.
Lincoln County: Chandler—Telegram-Democrat, News, Publicist; Stroud—Herald; Tyron—Mercury.
Logan County: Guthrie—State Capital, Leader, Register, Guide; Orlando—Herald; Mulhall—Enterprise; Langston—Herald.
Noble County: Perry—Sentinel, Enterprise-Times, Democrat-Patriot.
Oklahoma County: Oklahoma City—Champion, Farmer, Times-Journal, Oklahoman, McMaster's Weekly; Edmond—Republican, Sun-Democrat.
Pawnee County: Pawnee—Times-Democrat, Dispatch.
Payne County: Stillwater—Gazette, Populist, State Sentinel; Perkins—Journal.
Pottawatomie County: Tecumseh—Republican, Democrat, Leader; Shawnee—Quill, News, Blade; Earlsboro—Plainspeople; McLoud—Sunbeam.
Roger Mills County: Cheyenne—Sunbeam.
Washita County: Cloud chief—Herald-Sentinel, Beacon; Cordell—Messenger.
Woods County: Alva—Courier, Pioneer, Review; Cleo—Chieftain.
Woodward County: Woodward—News, Bulletin.
Osage Reservation: Pawhuska—Osage Journal.

Semi-monthly

Woodward—Live Stock Inspector.

Monthly.

Guthrie: Oklahoma Sunday-School Worker, Oklahoma Churchman, Oklahoma Christian, Oklahoma Medical Journal, Practical Pointers. Sanitary Bulletin.

Oklahoma City: Home, Field, and Forum.

Norman: Oklahoma School Herald, University Umpire.

Stillwater: College Mirror.

This shows a daily paper for every 23,000 people, a weekly for every 3,000, and a regular publication for every 2,300 of the population of the Territory; while Colorado shows 1 for every 2,500; New York, 1 for every 2,900; Ohio, 1 for every 3,200; Massachusetts, 1 for every 3,600, and Mississippi, 1 for every 6,400.

PREPARING HISTORY.

Early in the history of the Territory, W. P. Campbell, a newspaper man, of Hennessey, started a historical collection. Later this was turned over to the Oklahoma Press Association, and in 1895, by legislative action, the Territory received the collection in trust, a majority of the board of directors to be continued to be elected by the press association. Quarters were assigned for the collection in the university building at Norman, and a custodian put in charge.

The collection now fills two large rooms, and includes the files of all the Territorial newspapers and periodicals, and many of those of the Indian Territory, which will become very valuable for the student and historian of the future.

There are also many valuable manuscripts, photographs, pamphlets, and books, the whole forming a collection of interest and value at this time, and which will become invaluable as the Territory passes into history.

TERRITORIAL LIBRARY.

By legislative enactment in 1893 provision was made for a Territorial library and the office of Territorial librarian created.

The act of the legislature in 1893, creating the Oklahoma Library, provides that the proceeds derived from the sale of the statutes, session laws, and reports of the supreme court shall be turned over to the Territorial treasurer to the credit of the library fund, to be used for the purchase of books and other necessary expenses, and this fund, together with \$1,000 appropriated in 1895 and \$1,250 in 1897, has been the only means at hand with which to build up a library, yet when the present librarian took charge on April 14, 1898, the invoice showed 9,505 volumes, classified as follows:

First. Miscellaneous and public documents; reports of the Secretary of the Interior, Secretary of State, Secretary of Navy, Secretary of Treasury, Secretary of Agriculture, Postmaster-General, Attorney-General; consular reports; Congressional reports; House and Senate Journals; reports of State institutions of the various States, consisting of and including such books as are received by donation and exchange by the Oklahoma library—2,157 volumes.

Second. State reports, received from the various States in exchange for Oklahoma reports and by purchase, 1,800 volumes.

Third. American and Supreme Court reports, 275 volumes.

Fourth. Pacific Reporters, 50 volumes.

Fifth. Digests United States reports and laws, 79 volumes.

Sixth. Digests State reports and laws, 35 volumes.

Seventh. State laws, session laws, and statutes of the various States, including indexes to the same, acquired by exchange for Oklahoma statutes and by purchase, 267 volumes.

Eighth. United States Statutes, 21 volumes.

Ninth. Law text-books, 474 volumes.

Tenth. House and council journals, statutes, session laws, reports of supreme court, including all books published by Oklahoma Territory and now in the custody of the Territorial librarian, 4,347 volumes.

Since April 15, 1898, the librarian has received, by donation and exchange, 94 volumes, making the total number of volumes now in the library 9,599.

The library has been greatly cramped for room in the past, but a plan is now on foot to secure more commodious and comfortable quarters. I desire here to emphasize the fact that, while Congress has made liberal appropriations for the establishment and maintenance of libraries in Colorado, Kansas, Utah, Wyoming, and other States and Territories, not a dollar has ever been appropriated for this purpose in Oklahoma, and I desire to strongly urge the need and appropriateness of such an appropriation by Congress in the near future.

IMMIGRATION.

Immigration is being attracted to Oklahoma from all parts of the United States. Nearly 75,000 copies of my last annual report were circulated through the North and East, all of the metropolitan papers published extracts and made liberal mention of it, and the story of prosperity and progress told therein has been the means of turning the faces of thousands toward Oklahoma.

Our local newspapers are constantly telling the story of Oklahoma's prosperity, and the car of agricultural and horticultural exhibits sent out last fall, together with the fine display being made at the Omaha Exposition, have all served to convince the people that Oklahoma is the mecca for the homeseeker and the investor. As a consequence, people have been coming singly, by families, and in colonies, from all sections of the country, and particularly from the States of the North have come a desirable class of immigrants with ready money to purchase farms and stock and improve them, or to develop important business enterprises.

LEGISLATION.

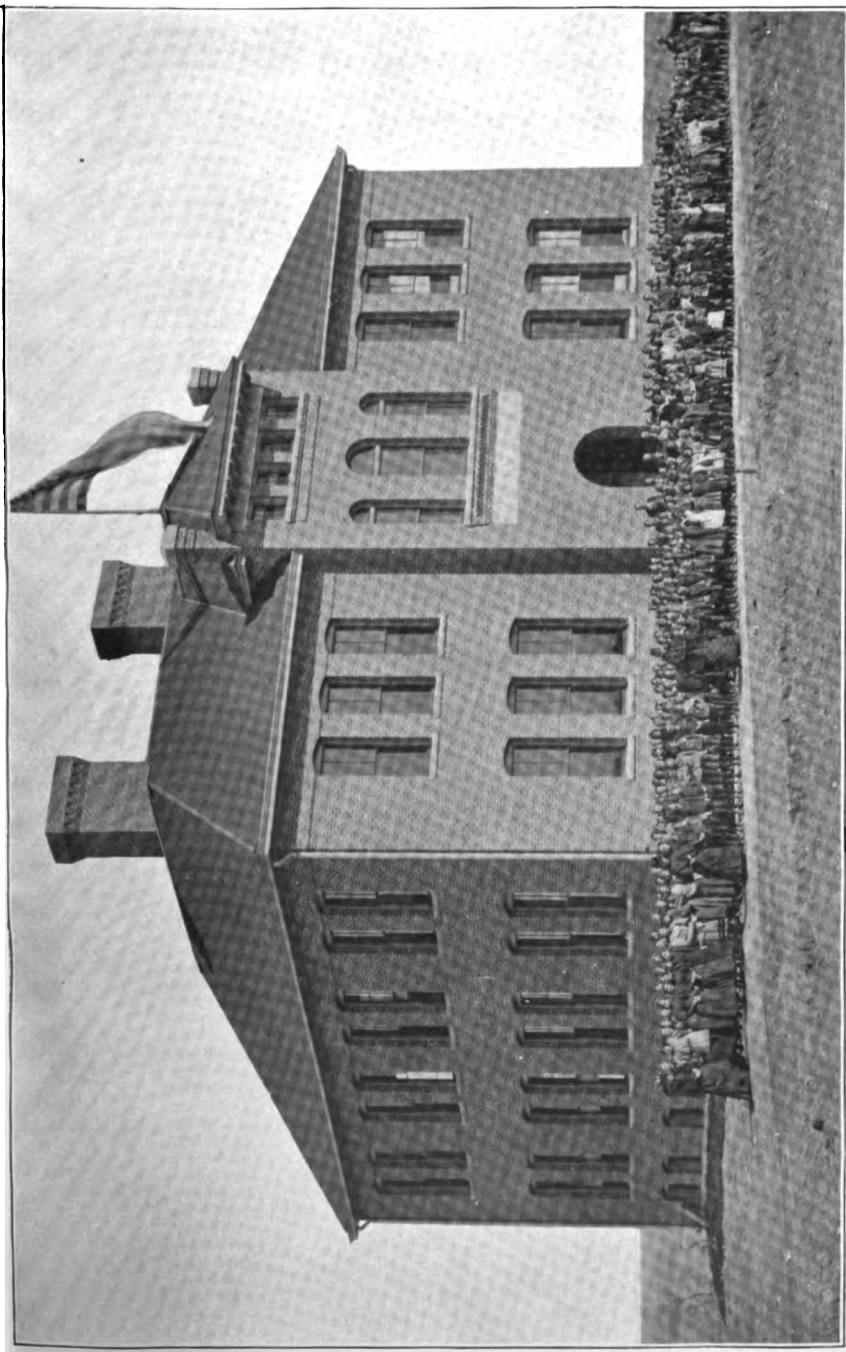
There has been no session of the legislature the past year, and hence no new legislation enacted. Some of the laws enacted during the session of 1896 have proven unwieldy and incongruous, and several have been declared inoperative by the supreme court.

No really vicious legislation has ever been enacted in the Territory, and none ever contemplated which would annul any contract or repudiate any just debt, public or private.

THE COURTS.

The business of the courts has been expeditiously administered during the past year. As time passes and the farm and town-lot contests and squabbles of the early days of settlement are settled, the business of the courts, both civil and criminal, grows less.

From information furnished by the several clerks of the courts, I give below a statement showing the business transacted in the supreme court and each of the district courts of the Territory.



EL RENO PUBLIC SCHOOL BUILDING.

Supreme court.

Number of cases docketed during the year	113
Number of cases disposed of.....	138
Total number of cases on docket June 30, 1898.....	121

District courts.

First district:	
Number of cases docketed during the year.....	740
Number of cases disposed of.....	600
Total number of cases on docket June 30, 1898.....	354
Second district:	
Number of cases docketed during the year.....	540
Number of cases disposed of.....	506
Total number of cases on docket June 30, 1898.....	255
Third district:	
Number of cases docketed during the year.....	891
Number of cases disposed of.....	666
Total number of cases on docket June 30, 1898.....	798
Fourth district:	
Number of cases docketed during the year.....	757
Number of cases disposed of.....	572
Total number of cases on docket June 30, 1898.....	368
Fifth district:	
Number of cases docketed during the year.....	487
Number of cases disposed of.....	453
Total number of cases on docket June 30, 1898.....	311

CRIMES AND PUNISHMENTS.

Oklahoma has at the present time 155 convicts in the penitentiary, a small number when the fact is considered that the population of the Territory is now considerably in excess of 300,000. There has long been an erroneous impression in many sections in the East that Oklahoma is populated largely by criminals and outlaws, but a little comparison to other States shows very favorably to Oklahoma.

Statistics show that Arizona has 1 convict to each 425 of population; Indiana, 1 to each 1,250; Kansas, 1 to each 1,600; Ohio, 1 to each 1,900, and Oklahoma, 1 to each 2,150.

The number received at the penitentiary during the year was 88 and the number discharged was 81, 29 of whom were pardoned, 2 died, and 1 escaped, making a net increase of but 7 prisoners for the year, a showing probably not equaled by the same number of people anywhere in the United States. The number of prisoners from the different counties of the Territory are shown as follows:

County.	No. of convicts.	County.	No. of convicts.
Beaver.....	2	Logan.....	30
Blaine.....	2	Noble.....	9
Canadian.....	20	Oklahoma.....	7
Cleveland.....	7	Pawnee.....	8
Custer.....	.....	Payne.....	8
D.....	2	Pottawatomie.....	11
Day.....	.....	Roger Mills.....	1
Garfield.....	1	Washita.....	3
Grant.....	5	Woods.....	2
Greer.....	5	Woodward.....	4
Kay.....	7	Total.....	155
Kingfisher.....	8		
Lincoln.....	13		

The Territorial convicts are kept in the Kansas penitentiary by contract, the rate having heretofore been 25 cents a day. In April of

this year, however, the Kansas authorities notified me that owing to lack of employment for even their own prisoners they could no longer keep the Oklahoma prisoners for less than 50 cents a day. After negotiating with several other States, I finally, on June 30, made a new contract with the State of Kansas to retain our prisoners for 35 cents a day, the contract to run one year, or until terminated by sixty days' written notice by either party.

The expense to the Territory for the year has been:

Transportation of convicts.....	\$3,377.18
Care and keeping.....	14,843.00
Total.....	18,220.18

This is an increase of \$1,715.83 over the preceding year. From a close scanning of the court dockets and of the newspapers of the Territory I am led to believe that crime of every description is on the decrease in Oklahoma.

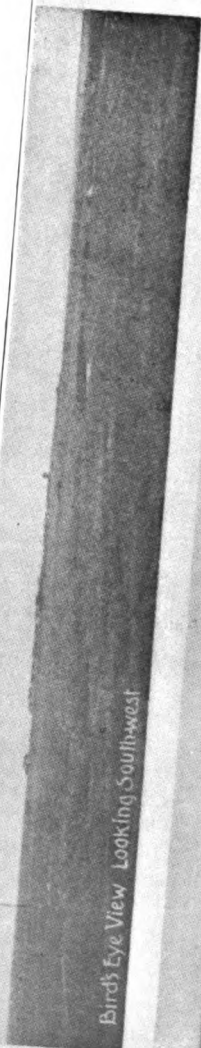
For the first time in the history of the Territory a lynching has taken place by a mob. On December 30 Mrs. Laird, wife of a white renter in the Seminole country, in the Indian Territory, was most brutally murdered and outraged in the presence of her little children, who watched by the mother's dead body part of a day and all of a night alone and in terror. When the murder became known the people were seized with frenzy, and capturing two Indian boys, whom they believed to be guilty, after a brief investigation and trial they dragged them over the line into Oklahoma Territory, tied them to a stake, and burned them to death. I am pleased to be able to state that a very large number of these lynchers were not citizens of Oklahoma. The object of coming across the line into this Territory to commit the crime seems to have been to escape the jurisdiction of the United States laws in force in the Indian Territory, the members of the mob probably believing that they could better fight the cases in the county courts of Pottawatomie County.

As soon as news reached the executive office of the mobbing I telegraphed all the authorities of the county to use every means to prevent further trouble, and to bring the guilty to justice, and at once offered \$1,000 reward (the highest amount allowed under the statutes) for the arrest and conviction of the lynchers. A large number of the members of the mob have since been arrested by the United States marshal's force, and are under heavy bonds to appear for trial at the next term of court.

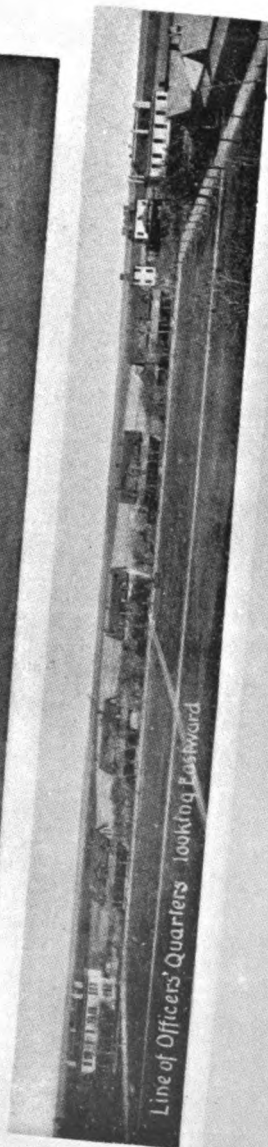
PUBLIC BUILDINGS.

Outside of her five handsome and commodious college structures Oklahoma has no public buildings belonging to the Territory. Sections 33 in a large portion of the Territory, were reserved by Congress and given to the Territory for the public-building fund, and from their lease has already been accumulated a fund of \$58,838.87 for the erection of public buildings. This fund is rapidly growing, and will form a handsome nucleus for the construction of a penitentiary, insane asylum, blind asylum, deaf-mute school, reformatory, and other institutions when the people of the Territory believe the time has come for locating them and erecting buildings. The prevailing sentiment, however, appears favorable to the deferring of the location and erection of such institutions until statehood is attained.

Bird's Eye View Looking Southwest



Line of Officers' Quarters looking Eastward



Interior - looking North



COUNTIES.

The affairs of the different counties are on the whole well managed, and in almost every county of the Territory expenses are beginning to be cut down and the tax rate decreased. A majority of the counties own their own court-houses and jails, which is speaking well for so new a country, and several really handsome structures have gone up the past year. In several of the counties the question of county-seat elections has been agitated, but has not gained enough force as yet to make any particular disturbance. It is to be hoped that this kind of agitation will be kept down in every county, as it is never productive of any real good.

The percentage of paupers in the Territory is so small that as yet there has been no necessity for the counties supplying poorhouses or poor farms.

The debts created by running the counties several years before any tax could be collected have in nearly all cases been bonded, and under the provisions of an act of the legislature, passed in 1895, the counties are all practically on a cash basis, being prohibited from creating any indebtedness in excess of 80 per cent of the tax levy for the year.

In no case has any county in Oklahoma repudiated a single just debt, and their bonds and warrants are the best of securities. The rapid proving up of land heretofore not subject to taxation, the increasing valuation of personal property, the erection of buildings, and the building of railways will enable the counties to meet these obligations very readily and at the same time still continue to reduce their tax rate.

CITIES.

Towns and cities spring up in a day in Oklahoma; in a week are established business centers; in a month are well-settled communities, and it is only a question of the time actually required by workmen to do the work until they have substantial buildings and improved streets and sidewalks, and a little later come waterworks, electric lights, and projected street car lines.

All of the principal cities of the Territory have electric-light systems, waterworks, ice plant, well-improved streets, good sidewalks, proper police and fire protection, strict health regulations, and excellent graded schools.

A recent act of Congress allowing the cities in Territories to bond themselves to construct sewers, improve streets, and establish waterworks will result in many permanent improvements along these lines in all of the cities of the Territory. In no city is the tax rate excessive; the expenses are readily met, and most of them are practically on a cash basis.

MILITARY POSTS.

The two military posts still occupied in the Territory are Fort Reno, in Canadian County, and Fort Sill in the Kiowa and Comanche Reservation, both historic and interesting points.

These posts are generally kept well garrisoned with troops, and I am glad to know that it is the policy of the Government to make them permanent posts and improve them accordingly. At the outbreak of the Spanish war the regulars, with the exception of a small guard, were taken from these posts to the front, leaving them largely unoccupied. The Oklahoma Battalion and Indian Territory Company of the

Arizona, Indian Territory, New Mexico, and Oklahoma First Volunteer Infantry are now rendezvoused at Fort Reno, and it is the Mecca for thousands of visitors who are delighted with the location and the beauty and comfort of the post.

Fort Supply, or Camp Supply, as it is generally known, located in Woodward County, in the northwestern part of the Territory, has been abandoned as a military post, and the commodious quarters and other buildings, with the thousands of acres of reservation now stand unused and unoccupied. A bill has been introduced in Congress to donate the post to the Territory for a soldier's home, another to donate it for an insane asylum, and the people of western Oklahoma are urging that it be converted into a live stock and veterinary experiment station.

It does seem to me that these fine buildings, which are now going to decay from neglect, and the reservation surrounding them, should become the property of the Territory at once by gift from the United States, and that they be utilized as the people of the Territory deem best.

OKLAHOMA NATIONAL GUARD.

The National Guard organization at the breaking out of the war were anxious to enter the United States service in a body, but this being impracticable many volunteered from every company; as a result, the strength of the militia has been greatly diminished, the total strength of the Oklahoma National Guard at this time being only about two hundred officers and enlisted men, with a regimental organization composed of ten companies of infantry and regimental band, located as follows:

Headquarters Company A and band, at Guthrie; B, at Alva; C, at Oklahoma City; D, at Ponca City; E, at Pawnee; F, at Shawnee; G, at Kingfisher; H, at Perry; I, at Newkirk; K, at Enid.

The band is fully equipped with the dress, undress, and summer uniforms and necessary instruments, and are on the same footing and subject to the same discipline and regulations as the National Guard, of which they are a part, and is a thoroughly efficient organization. Companies A and B are fully equipped with the undress uniforms of the same pattern used in the Army, the Springfield rifle, caliber .45, and with leggings, blanket bags, haversacks, and canteens. Companies C, D, E, F, G, I, and K are equipped with the undress uniforms and the Springfield rifles. Company H has never been equipped, but will be furnished with the same equipments this year.

The National Guard will be recruited up again to its original strength of five hundred officers and men, and in the course of two or three months may safely be relied upon for any ordinary emergency.

The personnel of the militia includes the best material among the young men of the Territory and the discipline is generally good.

The staff of the commander in chief is as follows :

Commander in chief and staff.

C. M. Barnes, governor and commander in chief.
 Bert C. Orner, second lieutenant and acting adjutant-general.
 J. H. Wheeler, colonel and inspector-general.
 M. J. Holt, major and judge-advocate-general.
 Paul Jundt, major and commissary-general.
 Richard Messall, major and paymaster-general.
 Samuel A. Maun, captain and aid-de-camp.
 Bert C. Maine, captain and aid-de camp.
 Otto R. Montgomery, captain and aid-de-camp.



PONCA CITY PUBLIC SCHOOL BUILDING.

OKLAHOMA IN THE WAR.

Long before the actual declaration of war with Spain I began receiving letters from patriotic citizens of the Territory offering their services in defense of the nation, and almost simultaneously with the opening of hostilities the militia companies all offered to volunteer and my mail was loaded down with offers to enlist under the flag of freedom. In the first call for troops we were accorded but one troop of cavalry or special mounted riflemen, and so great was the rush to enlist that a regiment could have been filled as readily as was the troop.

After a rigid examination, 80 men were mustered in to become a part of the First Regiment of United States Volunteer Cavalry, since become famous as Roosevelt's Rough Riders. The officers commissioned for this troop and the men mustered in were as follows:

Huston, Robert B., captain.
 McGinnis, Schuyler A., first lieutenant.
 Schweizer, Jacob, second lieutenant.
 Palmer, Orlando G., first sergeant.
 Webb, Gerald A., sergeant.
 Hill, Ira A., sergeant.
 Sands, George H., sergeant.
 Randolph, Joseph A., sergeant.
 Hunter, Charles E., sergeant.
 Hill, Calvin, corporal.
 McClure, David V., corporal.
 Norris, George, corporal.
 Rhoades, John D., corporal.
 Wetmore, Starr M., trumpeter.
 Moran, Thomas, farrier.
 Amrine, William D., private.
 Beard, Lyman F., private.
 Brandon, Perry H., private.
 Beal, Fred M., private.
 Byrne, Peter F., private.
 Brown, James T., private.
 Bailey, William, private.
 Burgess, George, private.
 Chase, Leslie C., private.
 Cease, Forest L., private.
 Cashion, Roy V., private.
 Crosley, Henry S., private.
 Crawford, William S., private.
 Cook, Walter M., private.
 Cross, William E., private.
 David, Icem J., private.
 Denham, Alexander H., private.
 Donthett, Mathew, private.
 Emery, Elzie E., private.
 Faulk, William A., private.
 Folk, Theodore, private.
 Freeman, Elisha L., private.
 Hill, Edwin M., private.
 Hulme, Robert A., private.
 Holmes, Thomas M., private.

Honeycutt, James V., private.
 Hunter, Paul W., private.
 Ishler, Shelby F., private.
 Johnston, Edward W., private.
 Jordon, Andrew M., private.
 Joyce, Walter, private.
 Luther, Arthur A., private.
 Love, Henry K., private.
 Loughmiller, Edgar F., private.
 Lusk, Henry, private.
 McMillen, Robert L., private.
 Meagher, Henry, private.
 Miller, Volney D., private.
 Miller, Rosco V., private.
 McGinty, William, private.
 Muxlow, Lorrin D., private.
 Mitchell, William H., private.
 Newcomb, Marcellus L., private.
 Norris, Warren, private.
 Pollock, William, private.
 Proctor, Joseph H., private.
 Palmer, William F., private.
 Page, John F., private.
 Reay, Scott, private.
 Russell, Albert P., private.
 Stewart, Clyde H., private.
 Scott, Cliff D., private.
 Shipp, Edward W., private.
 Staley, Francis M., private.
 Stewart, Clare H., private.
 Shockey, James M., private.
 Shanafelt, Dick, private.
 Smith, Fred, private.
 Tauer, William L., private.
 Thomas, Albert M., private.
 Vanderslice, James E., private.
 Weitzel, John F., private.
 Wilson, Frank M., private.
 Wright, William O., private.
 Woodward, John A., private.

These brave sons of Oklahoma were among the first American troops to land on Cuban soil, and they were in the thick of the fray at El Caney and La Quasina and acquitted themselves with honor. When the gallant Captain Capron (who had been a resident of Oklahoma for years and the first to volunteer to raise a regiment in the Territory) fell, the brave boys of Oklahoma and Indian Territory were close about, and dashing forward helped put the Spaniards to rout. Many were wounded in these fights before Santiago and several gave up their lives, but they shall live long in the memory of the people of the Territory, who honor them all for their patriotism and their bravery.

When the second call for troops was made, it seemed that C would be left out entirely; but I visited Washington, presented the matter to the Secretary of War, and by hard work and the aid of friends of the Territory finally secured the assignment of a battalion of infantry to Oklahoma, the same to form a part of a to be recruited from Arizona, New Mexico, Oklahoma, and Indian Territory. The rush to enlist was as great as under the first call, and one of the companies of the battalion had from 250 to 300 men for examination.

The officers commissioned and the men mustered into service are as follows:

Stone, John F., major.
Baker, William P., surgeon.
Ingram, Job, chaplain.

Barnes, Harry C., captain.
Neal, James P., first lieutenant.
Arrell, David B., second lieutenant.
Stewart, Charles N., first sergeant.
Laverty, Albert B., sergeant.
Garrison, Albert C., sergeant.
Filson, Karl J., sergeant.
Foster, Paul J., sergeant.
Williams, Joseph C., corporal.
Hill, Sherwood W., corporal.
Campbell, John M., corporal.
Burrell, Henry A., corporal.
Arnold, Jesse H., corporal.
Arnold, Samuel E., corporal.
Ripley, John M., corporal.
Lufkin, Charles H., corporal.
Hitch, William S., corporal.
Eppinger, Gottlute, corporal.
Stewart, Rufus L., corporal.
Bone, Charles, artificer.
Greiwer, Pius M., musician.
Perkins, Benjamin F., wagoner.
Adams, John F., private.
Adams, William J., private.
Beard, James C., private.
Bebout, Charles P., private.
Bonter, George A., private.
Brady, Thomas F., private.
Breedlove, William E., private.
Brown, Abraham L., private.
Brown, Orlin C., private.
Carwagey, Jet, private.
Chapman, Joe E., private.
Crowell, Charles M., private.
Chapin, Elba R., private.
Cottingham, Lou W., private.
Derrig, William E., private.
Davis, John S., private.
Dierolf, Henry J., private.
Durling, John V., private.
Elliott, Thomas B., private.
Elliott, Griffith, private.
Ewing, Silas R., private.
Ferguson, G. Walker, private.
Freed, William J., private.
Fessler, Frank A., private.
Fretz, Hazzard, private.
Harmon, Jake, private.
Hedglin, Benjamin A., private.
Harst, Walter W., jr., private.
Harvey, Charles, private.
Holmes, Wellington H., private.
Joiner, Daniel W., private.

Jones, Stanton A., private.
Kendall, Arthur E., private.
Kelley, James, private.
Kiespert, William S., private.
Klavitter, Jack, private.
King, John G., private.
Lewis, Ralph L., private.
Lovett, Thomas, private.
Lucas, Robert, private.
Loving, William V., private.
Lyon, George H., private.
Mason, Homer W., private.
Mayfield, Thomas J., private.
Marshall, Claude R., private.
Martin, Larkin N., private.
Mathias, Chris., private.
Metz, Ernest, private.
Mitchell, Jesse F., private.
Morris, George E., private.
Mundis, Jess C., private.
Miller, Ferris, private.
Mitchell, Thomas N., private.
Mulhall, Patrick, private.
Murry, Dan, private.
Norris, Millard B., private.
Ogborn, Arthur J., private.
Payton, George W., private.
Peoples, Ernest E., private.
Payne, George B., private.
Pearson, Ira B., private.
Phillips, Albert C., private.
Phillips, John W., private.
Phillips, Art., private.
Querry, Samuel R., private.
Reachy, Lewis, private.
Ripley, Elmer E., private.
Ray, Burt A., private.
Rice, Frederick H., private.
Robinnett, Robert L., private.
Rumford, Charley A., private.
Rodman, Will, private.
Sanders, Chesley L., private.
Sherman, John, private.
Sturgis, Bert H., private.
Taylor, William A., private.
Tompson, George F., private.
Viers, David S., jr., private.
Whitley, Stephen, private.
Witten, Edwin B., private.
Wright, Luther, private.
Wilson, Elmer, private.
Worline, Walter O., private.

Hoffman, Roy V., captain.
 O'Rourke, Jeremiah J., first lieutenant.
 Finley, Gordon L., second lieutenant.
 Barrett, Charles F., first sergeant.
 Minton, Lawrence E., quartermaster-sergeant.

Ulam, Peter L., sergeant.
 Palmer, John F., sergeant.
 Beard, John W., sergeant.
 Braselton, Samuel R., sergeant.
 Cowling, James J., corporal.
 Honeycutt, William L., corporal.
 Poling, Frank, corporal.
 Hamlin, James W., corporal.
 Bradshaw, Alie R., corporal.
 Johnston, Alphonso F., corporal.
 Egbert, Harry, corporal.
 Clark, Brent, corporal.
 Tomson, Robert E., corporal.
 Furber, James D., corporal.
 Morton, Daniel J., corporal.
 Ridenour, Charles A., corporal.
 Ashton, Orin, musician.
 Estes, William M., musician.
 Zipf, Leopold, artificer.
 Morris, Carl, wagoner.
 Adams, John Q., private.
 Albin, Dudley, private.
 Affolder, Charles A., private.
 Banks, Fred H., private.
 Barnard, Clay, private.
 Boyd, Howard, private.
 Braselton, Stephen O., private.
 Bush, Lbb A., private.
 Barker, James F., private.
 Buman, Leo L., private.
 Branderson, Andy H., private.
 Bryan, Daniel F., private.
 Bush, John S., private.
 Condon, George W., private.
 Davis, William, private.
 De Moss, George M., private.
 Dustin, Timothy W., private.
 Dorsey, William E., private.
 Donoghue, Harry J., private.
 Eboas, George W., private.
 Fees, Emerson H., private.
 Foster, James B., private.
 Fraley, Benjamin F., private.
 Finney, Elwood C., private.
 Foster, Madison A., private.
 Gallagher, Walter E., private.
 Gardner, Jefferson M., private.
 Glenn, Morgan R., private.
 Geren, Sherman, private.

Lowry, Robert A., captain.
 Platt, Henry A., first lieutenant.
 McFadyen, John A., second lieutenant.
 Workman, Jerome S., first sergeant.
 Baldwin, Nathan O., quartermaster-sergeant.
 Halzer, Chris., sergeant.
 Morris, John T., sergeant.
 Caswell, Henry U., sergeant.
 Taylor, Thomas J., jr., sergeant.
 Hasselton, Lerie G., corporal.
 Hayford, Elbert E., corporal.
 Harrington, Albert, corporal.
 Thomas, Roy W., corporal.

Gose, James F., private.
 Hall, John B., private.
 Hinch, John A., private.
 Heavner, William P., private.
 Johnson, John K., private.
 Keeney, John H., private.
 King, Harlon E., private.
 Kellison, William E., private.
 Knapp, Fred C., private.
 Lancaster, Norton T., private.
 Long, James D., private.
 Leach, Brice, private.
 Lumly, Eli M., private.
 McBride, James M., private.
 Mahler, Clarence J., private.
 Merricks, Charles, private.
 McCamman, William J., private.
 Martin, Lewis E., private.
 Mitchell, Andrew J., private.
 Norris, Fred J., private.
 Northen, Perry I., private.
 Owens, Ben, private.
 Payton, John C., private.
 Perswell, Clayton H., private.
 Pidcock, Odie, private.
 Poling, Alonzo, private.
 Pool, William T., private.
 Purnell, William T., private.
 Pomeroy, Arthur W., private.
 Pugh, Allen L., private.
 Quaiatta, Godlip A., private.
 Reilly, Joe, private.
 Ritchie, Charles T., private.
 Rogers, George F., private.
 Riley, William C., private.
 Rogers, George, private.
 Russell, James, private.
 Scogin, John D., private.
 Sherman, Calvin, private.
 Springer, Frank, private.
 Stewart, Edgar A., private.
 Sevier, Edward C., private.
 Soper, Alfred, private.
 Stager, James W., private.
 Tatum, William, private.
 Thompson, William A., private.
 Vermont, Edward, private.
 Wakefield, Isaac N., private.
 Watkins, Lewis J., private.
 Wray, George D., private.
 Warren, Thomas J., private.
 Webb, John V., private.
 Wightman, William M., private.
 Ziegler, Edwin F., private.
 Zimmerman, Sterling S., private.

Overton, Charles A., corporal.
 Spencer, Walter C., corporal.
 Edmondson, Howard, corporal.
 Slack, John O., corporal.
 Brixey, John T., corporal.
 Dickman, George, corporal.
 Northup, Frank D., corporal.
 Arrendiell, Schuyler C., corporal.
 Swallow, Marion S., musician.
 Hamlin, James E., musician.
 Shrader, Charles M., artificer.
 Hardesty, William M., wagoner.
 Annis, Earnest G., private.
 Arrendiell, Edward, private.

Baker, Monroe, private.
 Barrett, Wilmer K., private.
 Bell, Abner D., private.
 Booue, Paul, private.
 Brandon, William N., private.
 Brewster, Charles C., private.
 Bryan, Bert B., private.
 Bryan, Richard A., private.
 Buck, Charles A., private.
 Burnett, Clyde B., private.
 Canfield, Ula G., private.
 Casteel, Fred, private.
 Crosby, Arthur, private.
 Crosby, Ray, private.
 Crusha, John F., private.
 Darenport, Alma E., private.
 David, Edward, private.
 Davidson, Ernest B., private.
 Dedrick, William H., private.
 Dennis, Elijah J., private.
 Devall, Henry C., private.
 Devine, Hubert, private.
 Dixon, Albert J., private.
 Eckes, Frank B., private.
 Etter, Charles, private.
 Fesler, Robert, private.
 Foreman, Ben F., private.
 Frost, Earl, private.
 Gamble, Jerome R., private.
 Garault, Homer, private.
 Gilbert, Marion A., private.
 Goss, Clarence L., private.
 Hancock, Everle W., private.
 Haney, Henry, private.
 Hannah, George W., private.
 Hausbrough, Hubert J., private.
 Harrell, Rallston G., private.
 Harris, Ira, private.
 Haviland, Joseph, private.
 Houston, Clinton O., private.
 Jenkins, Leander, private.

Boynton, Fred L., captain.
 Wheeler, James M., first lieutenant.
 Switzer, Simon W., second lieutenant.
 Foose, Seymour, first sergeant.
 Salter, Lewis A., quartermaster-sergeant.
 Switzer, Earl G., sergeant.
 Hunter, Fred W., sergeant.
 Alley, John P., sergeant.
 Douglass, Ernest G., sergeant.
 Hackett, John, corporal.
 Holbrook, George W., corporal.
 Hart, Grant A., corporal.
 West, Charles J., corporal.
 Stewart, Fred H., corporal.
 Sheetz, James L., corporal.
 Oates, David C., corporal.
 Way, Ross R., corporal.
 Baldwin, George A., corporal.
 Myers, William P., corporal.
 Smith, Horace G., corporal.
 Craig, Dorris, corporal.
 Bonnett, George P., musician.
 Devin, Charles, musician.
 Bastion, Charles H., artificer.
 Higginbotham, Martin L., wagoner.
 Adams, Rollie G., private.
 Anderson, Edward E., private.
 Arnold, John W., private.

Johnson, William, private.
 Knox, John W., private.
 Korns, Robert L., private.
 Lacy, Henry, private.
 Landis, Allen J., private.
 Lefever, Charles, private.
 Lester, Rease L., private.
 Lyon, Wesley, private.
 Marin, George, private.
 May, Jay V. D., private.
 Minor, George W., private.
 Morgan, James T., private.
 Newton, William, private.
 Noblet, George R., private.
 Perrizo, Fred, private.
 Pickard, Aleck C., private.
 Quick, William H., private.
 Rains, George W., private.
 Ralls, William R., private.
 Reynolds, Ira, private.
 Ridgeway, William F., private.
 Simmons, William, private.
 Smith, Leon, private.
 Stallard, William M., private.
 Sullivan, John W., private.
 Teel, Benjamin F., private.
 Tucker, Edwin A., private.
 Vario, Edward, private.
 Waldo, Edward, private.
 Walker, James W., private.
 Wasson, George S., private.
 Waters, George F., private.
 Watkins, Elmer, private.
 Williams, Albert D., private.
 Williams, Clyde B., private.
 Williams, James W., private.
 Wilson, Virgil A., private.
 Wilson, William A., private.
 Witcher, Frank, private.
 Witcher, Irmin R., private.
 Yarbrough, Loyd D., private.

Baker, James A., private.
 Ballinger, Bert O., private.
 Bass, Frank H., private.
 Baxter, Louis J., private.
 Benedict, Omer K., private.
 Bienz, Abram W., private.
 Bliss, George T., private.
 Bradshaw, Albert E., private.
 Bricker, Jacob W., private.
 Brown, Charles C., jr., private.
 Brown, Oscar H., private.
 Burson, Homer T., private.
 Conaway, James R., private.
 Decker, Selby J., private.
 Diefendorf, Floyd, private.
 Durkett, Clarence S., private.
 Farmer, James F., private.
 Faughn, James W., private.
 Freed, George W., private.
 French, Albert N., private.
 Garren, Frank T., private.
 Gibbons, James F., private.
 Gifford, Charles B., private.
 Hall, Robert L., private.
 Hally, Mark, private.
 Hammer, Carl S., private.
 Hicks, Joseph F., private.
 Hobson, Seth C., private.

Homer, Edgar A., private.
 Houghton, Elmer E., private.
 Jackson, Edward C., private.
 Jennings, Carson A., private.
 Johnson, Oscar W., private.
 Jolliff, Frank, private.
 Kelley, Walter B., private.
 Kesterson, Arthur, private.
 Kugle, Giles C., private.
 Lawrence, Edward, private.
 Litteer, Earl J., private.
 Long, Edward H., private.
 McFaddin, Winfield S., private.
 McIrvin, Arthur H., private.
 Miller, Henry J., private.
 Miller, Walter J., private.
 Montgomery, John M., private.
 Morris, Thomas B., private.
 Mott, Eddie L., private.
 Myers, Oliver J., private.
 Paul, Alonzo S., private.
 Paul, John W., private.
 Petet, Louis A., private.
 Pope, William E., private.
 Poppelbaum, Thomas, private.
 Power, Alvin W., private.
 Proskey, John, private.
 Morrison, Ira I., first lieutenant.

Reap, Edward A., private.
 Rector, Benjamin F., private.
 Ricketts, Mansfield O., private.
 Roberts, Cleaborn, private.
 Roberts, George W., private.
 Robertson, Otis, private.
 Rockwell, Fred J., private.
 Rolan, Francis M., private.
 Rose, John, private.
 Ross, Ira V., private.
 Russell, Claude W., private.
 Ruckman, William C., private.
 Sharp, Newton E., private.
 Sims, James P., private.
 Slemp, Charlie C., private.
 Sloan, John A., private.
 Smith, Jake, private.
 Smith, James A., private.
 Smith, Joseph F., private.
 Snoddy, James C., private.
 Sweet, Harry O., private.
 Swink, Harry L., private.
 Turner, Harry M., private.
 Venker, George F., private.
 Wilson, William D., private.
 Wood, Lee V., private.
 Morrison, Ralph E., hospital steward.

TRANS-MISSISSIPPI AND INTERNATIONAL EXPOSITION.

The legislature failed at its last session to make an appropriation for an exhibit of the Territory's products and resources at the Trans-Mississippi and International Exposition now in progress at Omaha, Nebr. The work of the executive office was such that it was very late in the year before I could give this matter any attention.

Early in the spring I appointed Hon. J. C. Post, of Kingfisher, vice-president for Oklahoma and chairman of the Territorial commission, and appointed commissioners from a number of the leading counties of the Territory. After giving the matter considerable thought and attention and discussing every possible means of providing funds, I asked the railway companies and different counties of the Territory to advance the money needed, with the assurance that a strict accounting would be made for every dollar advanced, and that the whole matter should be reported to the legislature in detail and they would be asked to make an appropriation to refund the amounts donated.

Funds were then subscribed and paid as follows:

Atchison, Topeka and Santa Fe Railway Company	\$1,000
Chicago, Rock Island and Pacific Railway Company	1,000
Choctaw, Oklahoma and Gulf Railway Company	500
Logan County	300
Noble County	250
Kingfisher County	200
Garfield County	250
Canadian County	250
Total	3,750

Mr. Post, the chairman, in the spirit of enterprise that characterizes the original Oklahoma settler and in the goodness of his heart, guarantees to advance \$1,000 more if necessary to secure a successful display of our agricultural resources at Omaha.

An excellent space was secured for the Territory in the agricultural building, and early in June the exhibit began taking shape.

It was early for any products of this year; not much had been saved from last; some of the commissioners failed to do anything, and the work went very slow at first; but up to this time three carloads of specimen products have been forwarded, and others will follow.

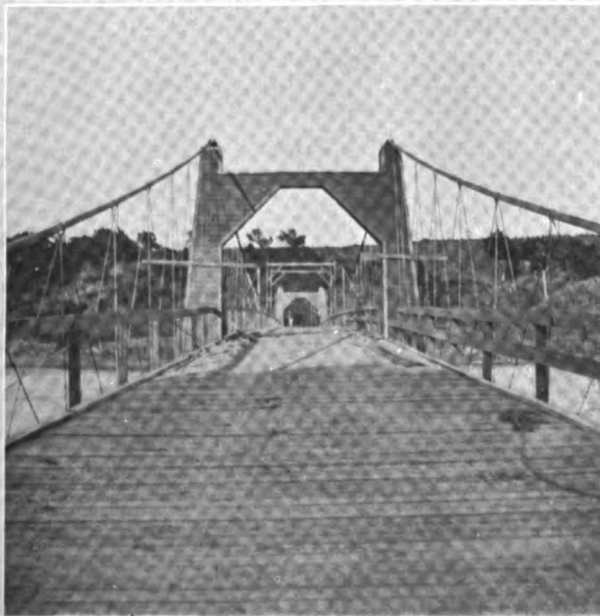
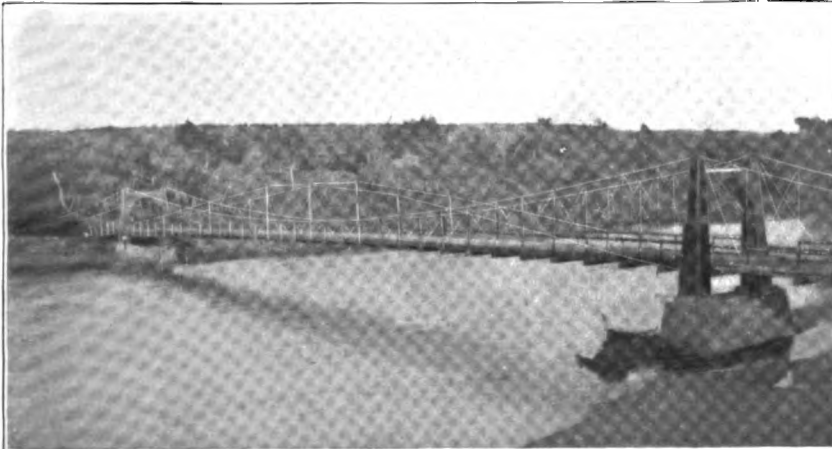
The exhibit now compares favorably with the agricultural exhibit of any State, and before the exposition closes we expect to eclipse many of the other displays.

Oklahoma, while the Territory was in its earliest infancy, and agriculture as yet an experiment, took first premiums on wheat, cotton, and flour, and awards on six other products, at the World's Fair in Chicago, and we expect to secure a number of awards and attract much favorable attention and comment at this great Western exposition.

OFFICIAL ROSTER.

The change of national Administration has resulted in a change of most of the Territorial and Federal officials of Oklahoma during the past year. The official roster at this time is as follows:

Governor: Cassius M. Barnes.
 Secretary of the Territory and ex-officio lieutenant-governor: W. M. Jenkins.
 Attorney-general: Harper S. Cunningham.
 Treasurer: Frank M. Thompson.
 Superintendent of public instruction and ex officio auditor: S. N. Hopkins.
 Secretary school land board and ex officio school land commissioner: Charles H. Filson.
 Assistant secretary: Joseph H. Norris.
 Private secretary to the governor: Fred L. Wenner.
 Assistant secretary of the Territory: James J. Houston.
 Deputy auditor: E. P. McCabe.
 Oil inspector: Amos A. Ewing.
 Bank examiner: John M. Pugh.
 Librarian: George H. Dodson.
 Acting Adjutant-general: Bert C. Orner.
 Superintendent of public health: L. Haynes Buxton, M. D.
 Delegate in Congress: J. Y. Callahan.
 Territorial school land board: Governor Barnes, Secretary Jenkins, and Auditor Hopkins.
 Board of railway assessors: Governor Barnes, Secretary Jenkins, and Auditor Hopkins.
 Board of equalization: Governor Barnes, Secretary Jenkins, and Auditor Hopkins.
 Banking board: Governor Barnes, Secretary Jenkins, Attorney-General Cunningham, Treasurer Thompson, and Auditor Hopkins.
 Regents of the Territorial University: Governor Barnes; Henry E. Asp, of Guthrie; James D. McGuire, of Norman; James H. Wheeler, of Oklahoma City; and C. O. Blake, of El Reno. (One vacancy.)
 Regents of the Agricultural and Mechanical College: Governor Barnes; B. S. Barnes of Ponca City; R. J. Edwards, of Oklahoma City; J. C. Tonsley, of El Reno; C. J. Benson, of Shawnee; and Robert A. Lowry, of Stillwater.
 Live-stock sanitary board: Same as regents of Agricultural and Mechanical College.
 Board of education of normal schools: Superintendent of Public Instruction Hopkins, Treasurer Thompson, D. P. Marum, of Woodward; L. J. Gunn, of El Reno; and D. D. Leach, of Oklahoma City.
 Board of regents of Colored Agricultural and Normal University: Superintendent of Public Instruction Hopkins, Treasurer Thompson, Rev. L. H. Holt, of Guthrie; E. O. Tyler, of Kingfisher; and John W. Hamilton, of Oklahoma City.
 Territorial board of education: Territorial Superintendent of Public Instruction Hopkins; President D. R. Boyd, of Norman; President E. D. Murdaugh, of Edmond; Prof. B. F. Nihart, of Oklahoma City; and Prof. L. E. Cooley, of Shawnee.
 Presidents of the Territorial institutions of learning: D. R. Boyd, Norman, of the Territorial University; E. D. Murdaugh, Edmond, of the Normal School; J. C. Ament, Alva, of the Northwestern Normal; G. E. Morrow, Stillwater, of the Agricultural and Mechanical College; Iuman E. Page, Langston, of the Colored University.
 Board of health: Auditor Hopkins; Dr. L. H. Buxton, of Guthrie; and Dr. F. S. Hamilton, of Norman.



SUSPENSION BRIDGE 400 FEET LONG OVER SOUTH CANADIAN RIVER AT NOBLE.

Board of pharmacy: F. B. Lillie, of Guthrie; C. N. Dow, of Pond Creek; and E. E. Howendobler, of Perry.

Board of dental examiners: W. E. Furrow, of Guthrie; Robert Wilson, of El Reno; E. E. Kirkpatrick, of Oklahoma City; J. Q. Waddell, of Kingfisher; and L. A. Kelsy, of Chandler.

Supreme court: Chief justice, J. H. Burford, of Guthrie; associate justices, J. C. Tarsney, of El Reno; B. F. Burwell, of Oklahoma City; B. T. Hainer, of Perry; and J. L. McAtee, of Enid. These judges also serve as judges of the district courts in the first to fifth districts, respectively.

Clerks of courts: Supreme court, B. F. Hegler, of Guthrie; first district, M. C. Hart, of Guthrie; second district, J. H. Warren, of El Reno; third district, Byron H. Shear, of Oklahoma City; fourth district, W. F. Harn, of Perry; fifth district, J. C. McClelland, of Pond Creek.

FEDERAL OFFICERS.

United States district attorney: Samuel L. Overstreet.

Assistant United States attorneys: John H. Scothorn and B. S. McGuire.

United States marshal: C. H. Thompson.

Registers and receivers of land offices: Guthrie, J. J. Boles and F. E. McKinley; Oklahoma City, S. S. Price and A. H. Classen; Kingfisher, E. E. Brownlee and J. V. Admire; Enid, J. B. Cullison and J. J. S. Hassler; Perry, A. H. Boles and J. J. Powers; Alva, R. A. Cameron and W. J. French; Woodward, F. S. Healy and J. W. Miller; Mangum, H. D. McKnight and James Kelly.

United States Indian agents: Osages, W. J. Pollock, Pawhuska; Poncas, Pawnees, and Otoes, John Jenson, Whiteagle; Iowas, Sacs and Foxes, and Pottawatomies, Lee Patrick, Sac and Fox; Cheyennes and Arapahoes, Maj. A. E. Woodson, Darlington; Kiowas, Comanches, and Apaches, W. T. Walker, Anadarko.

INDIANS.

The number of Indians in Oklahoma at this time is 13,033. They are under the care of five different agencies, the total enumerations being as follows:

OSAGE AGENCY.

Osages	1,800	Kaws	215
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WHITE EAGLE AGENCY.

Poncas	608	Otoes	356
Pawnees	706	Tonkawas	53

SAC AND FOX AGENCY.

Sac and Fox	495	Pottawatomies	780
Iowas	86	Kickapoos	355
Shawnees	493		

DARLINGTON AGENCY.

Cheyennes	2,200	Arapahoes	1,100
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KIOWA AGENCY.

Kiowas	1,105	Apaches	197
Comanches	1,526	Wichita and affiliated tribes	958

Contrary to the general opinion that the Indians are passing away, nearly every one of these tribes is gradually increasing in numbers.

While the Indians as a whole are advancing in the scale of civilization, the advance of those whose lands have been allotted and the residue opened to settlement is so much greater than of those still holding tribal reservations that he who runs may read the solution of the Indian problem—allotment, division, education, and self-reliance.

The Tonkawas, Pawnees, Sacs and Foxes, Iowas, Pottawatomies,

Shawnees, Kickapoos, Cheyennes, and Arapahoes have taken their lands in severalty and had the balance thrown open to settlement. The other tribes live on large reservations away from whites and the influences of full civilization.

While the wigwam, the red blanket, and other evidences of nomadic and semibarbarous days are still in evidence here and there, the majority of Indians now live in houses, wear "store clothes," and practice many of the arts of civilization.

The sun and ghost dances and other savage rites are gradually passing away, less time spent in wholesale visiting and riotous feasting, and more in farming and other industries, polygamy being stamped out and the women more or less emancipated from the slavish life of the past. The Indians as a whole are quiet and law-abiding, and the courts or officers of the law have had little or no real trouble with them in the history of the Territory.

CHEYENNES AND ARAPAHOS.

These Indians occupy land in the western part of the Territory. They are recognized as citizens under the allotment system, and each individual holds 160 acres of land, upon which about 75 per cent of them have established permanent homes. Many of these have built for themselves (partly from the proceeds of their own labor) comfortable dwelling houses. They have made rapid progress in civilized habits during the past few years. All able-bodied men engage in farming and cultivate from 5 to 60 acres, upon which they grow fair crops when the season is favorable.

Maj. A. E. Woodson, who has been the agent in charge of these tribes for a number of years and met with remarkable success in his work among them, says of his charges in a recent report to me:

Under the rigid system of withholding gratuitous supplies from those who will not work, and the encouragement of those who will by a generous distribution of farming utensils, the evolution of these people from a barbarous condition, though gradual, is quite marked. They obey the laws and conform to the requirements of the Government, exercised with kindness and firmness, and show evidence of becoming good citizens when the civilizing influences of education shall have swept away the ignorance and superstition which has been their heritage for generations.

The school facilities furnished by the Government are now sufficient to accommodate the children of school age, while compulsory attendance is exacted from all. It is observed that these Indian children acquire education just as rapidly as white children, and as evidence of this fact attention is invited to the large number of Indian teachers and others employed in the Indian schools throughout the country. Though the right of these Indians to vote is recognized, no effort to exercise their right has been made except among those who have been educated.

The absence of drunkenness among them is most marked; a drunken Indian is seldom seen, and it is noted that fewer crimes are committed by them than by a similar number of white citizens of the Territory. At this time I know of no Indian of this agency in prison.

Marriages are now consummated under the laws of the Territory. Violations of such laws are promptly punished by local courts. The lack of progress which usually attends upon the frequent changes of Indian agents at the several agencies throughout the country is not witnessed among these Indians. That so large a number of Indians, who but recently were brought under control as citizens and compelled to abandon tribal customs, which militated against all progress toward civilization, are progressing so well elicits surprise as well as commendation. They are now living amicably side by side with their white neighbors, who have learned that they are not "as black as they have been painted," and that the statement that "there are no good Indians except dead ones" is a fallacy.

KAWS AND OSAGES.

Hon. William J. Pollock, United States Indian agent at Pawhuska, in a recent communication says of these people:

The Kaw Indians reside at the northwest corner of the Osage Reservation, on a reservation of their own containing 100,000 acres, a considerable portion of which, along the river and creek bottom, is very fine arable land, and is now to a considerable extent under cultivation. This 100,000 acres, which was formerly a part of the Osage Reservation, has for its northern boundary the Kansas State line, and for its western boundary the Arkansas River. There are three leased cattle ranches of this reservation which bring to the Kaws considerable revenue, but in the main they are self-supporting, quiet citizens. The Kaws formerly had an independent agency, where their school and agency affairs were conducted, but it is now under the supervision of a "clerk in charge" as a subagency under the Osage agent.

The Osage Reservation contains about 1,400,000 acres of land, of which the greater portion is more or less broken, and rocky highlands, fit for grazing purposes only, with intervening creek bottoms, and particularly the Arkansas River bottom lands, which are among the finest agricultural lands in the world. Corn and wheat are raised here in abundance, and the crops this year are simply immense. The Osage Reservation contains 22 leased cattle pastures, from which these Indians derive an annual income of over \$40,000.

There are about 1,800 Osage Indian citizens, about half of whom are full bloods, and the other half mixed in various degrees with the Anglo-Saxons, etc.

These people stand alone in the history of the world as to the ownership of their land, having bought and paid for it with a tribal fund, yet hold it in common with a treaty guaranty (made in 1866) by the United States that no State or Territory shall ever pass laws extending jurisdiction over them without their consent.

They have the finest equipped school buildings, etc., in the United States. They also have to their credit in the United States Treasury about \$9,000,000, on which they draw 5 per cent interest, which is paid to them in quarterly installments, pro rata, by their agent, and this is altogether the most exacting and responsible duty of the agent, requiring more clerical work of a devious and exacting character than any other Indian agency.

Most of the farming carried on by these rich and aristocratic aborigines is really done by white tenants, as these Indians are too rich and too proud to work.

There are on the Osage Reservation a very large agency, boarding school, and two contract schools, all well attended, where their youths are slowly but surely approaching the educational pathway of their white brothers.

PONCA AGENCY.

Hon. John Jensen, United States Indian agent at Whiteagle, in a recent communication gives the following interesting facts about the tribes of this agency:

There are four tribes of Indians under the supervision of this agency—Poncas, Pawnees, Otoes and Missourias, and Tonkawas. The condition of these Indians is gradually improving. The majority of them are fast abandoning their nomadic habits and are adopting the pursuits of civilized life more or less. The following figures exhibit the amount of produce raised by the several tribes during the past fiscal year:

Wheat	bushels..	31,000
Corn	do.....	46,135
Potatoes	do.....	1,800
Turnips	do.....	210
Onions	do.....	120
Beans	do.....	555
Melons	number..	14,500
Pumpkins	do.....	4,400
Hay	tons..	1,240
Butter	pounds..	997
Lumber, sawed	feet..	182,601
Wood, cut	cords..	405

The stock owned by the several tribes may be enumerated as follows:

Horses	2,022
Mules	57
Burros	9
Cattle	204
Swine	203
Domestic fowls	1,072

A very great change in the financial condition of the Poncas, Pawnees, and Tonkawas comes from the fact that thousands of acres of their lands are leased to good farmers, who pay cash rentals ranging from 40 cents to \$1.50 per acre. This will also apply to the Otoes when the Department approves their allotments.

While the lands throughout the agency are well adapted to the production of wheat, corn, and fruits, they are also wonderfully suited to cattle raising, and it shall be my policy to encourage this pursuit.

There are three boarding schools throughout the agency—Ponca, Pawnee, and Otoe—with a combined enrollment of 303 pupils. These institutions are all in a most flourishing condition.

SOME NOTED PRISONERS.

At Fort Sill, in the Kiowa and Comanche Reservation, are 300 Western Apaches, held as prisoners of war by the United States. Among them is Geronimo, once the terror of all the West. They are all peaceable and engaged in farming and other pursuits, but are closely guarded at all times by United States troops detailed for that duty. Geronimo, the once bloody warrior, is at present reported to be running a sawmill.

The missionary and educational work being done by various religious organizations among the Indians of the Territory is bringing about a great change in their condition, and several once noted chiefs, who led their tribes in bloody warfare against the whites, are now humble preachers of the gospel.

INDIAN RESERVATIONS.

No material changes have taken place upon and around the Indian reservations in Oklahoma.

The Supreme Court of the United States has recently decided that personal property of traders and cattle owners in the Osage Nation is subject to like taxes as are levied in the counties to which it is attached by law for judicial purposes. This has stirred them up to endeavor to secure the passage of an act of Congress attaching that nation to the Cherokee Nation, so that they may escape all taxation. It seems perhaps a hardship to require them to pay taxes other than the Territorial tax and the taxes levied for court expenses, and I have no doubt the legislature which meets the coming winter will modify the laws to that extent.

I earnestly recommend that the bill now pending in Congress to ratify the treaty heretofore made with the Kiowas, Comanches, and Apaches, and the Wichitas and affiliated tribes be enacted, and urge the speedy opening to settlement of the surplus lands that will be acquired by the United States under said treaty.

The rapid advancement being made by the Indians whose lands have been allotted in severalty is a strong argument in favor of opening to white settlement all reserved lands not actually needed by the Indians.

BEAVER COUNTY.

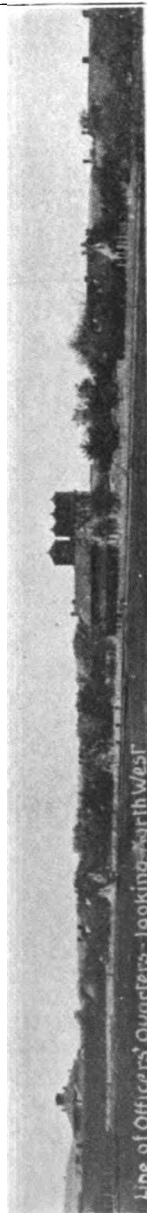
Beaver County, extending, in a strip 168 miles long and 35 miles wide, west from the northwestern part of the Territory, is a vast expanse of territory with conditions quite different from the greater part of Okla-



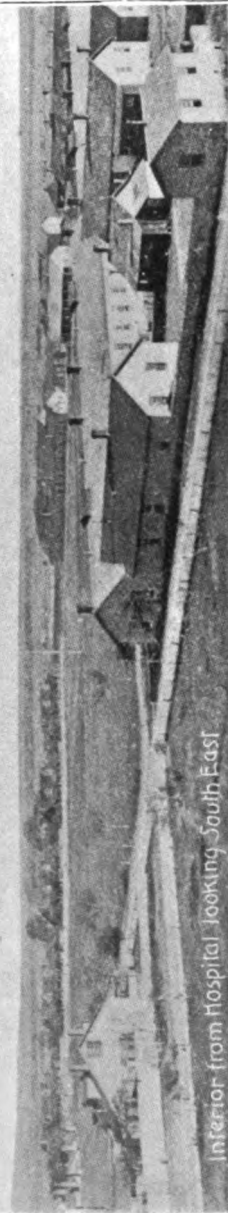
Bird's Eye View looking North West



Bird's Eye View looking Eastward



Line of Officers' Quarters - looking North West



Interior from Hospital looking South East

FORT SILL, OKLAHOMA TERR.

homa. This county was for a long time known as No Man's Land, not being under the jurisdiction of any State or Territory and no laws whatever being in force there. Many settlers were in this land at that time, and they organized a provisional government, and on March 4, 1886, resolved themselves into a territory to be called Cimarron, elected Dr. Chase a Delegate to Congress, and demanded recognition. Nothing came of this organization, however, except as a means of protecting property rights among the settlers, and in 1890 when Oklahoma was organized as a Territory, No Man's Land was made a part of it as Beaver County.

The county contains 3,681,000 acres of land, 3,255,955 acres of which are yet open for homestead entry absolutely free to settlers. While there are many settlers in this county who have fine farms along the streams, the greater portion of the land, lying as it does on the high western plains, is suited only for cattle and sheep raising. A man can not do much in these industries on 160 acres of land, which is all he can secure under the homestead laws, and it seems to me that the restoration of tree-claim and preemption rights to this section, or the privilege of purchase of a limited area at Government price, would be but a matter of justice to these people and aid greatly in opening up and developing that portion of the Territory.

SOME NEEDED LEGISLATION.

The bill now pending in Congress ratifying the treaty with the Kiowa, Comanche, and Apache Indians, and providing for the opening of the residue of their reservation to settlement after the members of the tribes have selected their allotments, reserves sections 16 and 36 in each township for school purposes, but fails to make reservation of sections 13 and 33 for colleges and public buildings. This is a matter of great importance to the people of Oklahoma, and the bill should be amended so as to reserve these sections and also to give the Territory the right to select from the public lands, not otherwise disposed of, indemnity lands in lieu of sections 13 and 33 in original Oklahoma for like purposes. The educational and public-institution interests of the future State of Oklahoma will thus be advanced, and in the light of the donations of land to other States and Territories I believe it but a matter of right and justice that such reservations be made, and urge your good offices in behalf of such measures, and in connection with the subject I desire to call your special attention to the phraseology of the acts of Congress reserving said lands for common school and college purposes in that part of the Territory known as the Cherokee Strip. Under these acts it is contended that the proceeds arising from the leasing of such lands should constitute a fund separate and apart from the funds arising from leasing of lands in other parts of the Territory and should be distributed for the use and benefit only of the schools within said lands.

It has been held by the Territorial government that the funds arising from the leasing of sections 16 and 36 in the Strip should constitute a part of one common fund arising from the leasing of all the lands donated or reserved for like purposes in all parts of the Territory, and distribution has been made pro rata to all the common schools of the Territory and upon the annual school enumeration made by the various counties, and the funds arising from the leasing of section 13 in the Strip have been distributed to the various universities, normal schools, and agricultural colleges as seemed to be for the best interest of the

various higher educational institutions in the Territory. I suggest that Congress shall pass an act correcting the ambiguity and uncertainty of the existing law, to the end that no further contention should be had over the distribution of these funds and to prevent litigation otherwise likely to arise.

STATEHOOD.

Since the passage of the Curtis bill, changing to some extent the status of the Five Civilized Tribes and apparently postponing the question of statehood therefor for several years, the sentiment in Oklahoma is somewhat stronger for immediate statehood than when I made my last report.

All political parties have this year declared in favor of statehood upon such terms and with such boundaries as may seem best to Congress.

Respectfully submitted.

C. M. BARNES, *Governor.*

The SECRETARY OF THE INTERIOR,
Washington, D. C.

ANNUAL REPORT
OF THE
MINE INSPECTOR FOR THE INDIAN TERRITORY.

SOUTH MCALESTER, IND. T., *June 30, 1898.*

SIR: In compliance with the requirements of the act of Congress approved March 3, 1891, entitled "An act for the protection of the lives of miners in the Territories," I have the honor to submit to you my fifth annual report upon the condition of the coal mines in the Indian Territory for the year ended June 30, 1898.

Very respectfully yours,

LUKE W. BRYAN,
Mine Inspector for the Indian Territory.

HON. CORNELIUS N. BLISS,
Secretary of the Interior, Washington, D. C.

The changes and extensions of the coal-mining business during the past year are generally as follows: The Kansas City, Pittsburg and Gulf Railroad has a line running from Kansas City to Port Arthur, on the Gulf of Mexico, which road is about 800 miles in length, enters the Indian Territory a few miles south of Siloam Springs, Ark., from which point it runs a little west of south until it reaches Salisaw, on the Kansas and Arkansas Valley Railway, and from which point it runs east of south until it reenters the State of Arkansas at a town called Howard, the length of this road in the Indian Territory being about 130 miles. On its course it travels at right angles to the general trend of the principal coal field of the Indian Territory, and crosses both the north and south crops of the coal vein which extends westward from Jenny Lind, in Arkansas.

The first crossing is made near mile post 316 on the Kansas City, Pittsburg and Gulf, at which point the coal shows only one of its measures, which is 2 feet 8 inches thick, dipping to the northwest 15 degrees. Two miles south of this point the measures reverse, and the crop of the vein of coal extending from Hackett City, Ark., westward crosses the Kansas City, Pittsburg and Gulf Railroad, the depth of this vein at this point being 3 feet 7 inches thick, and dipping to the southeast with a pitch of about 20 degrees. About 4 miles farther south, and about 2 miles distant from the railroad track, is a vein of coal known as the Cavanal Mountain Vein, which crops out of the side of the mountain at an elevation above the track of about 250 feet. This vein is about 4 feet in thickness, and has a parting of slate, showing all the characteristics of and being the same vein as that operated by the Cavanal Coal, Coke and Railway Company, which has a track from this mine in the mountain to the St. Louis and San Francisco road at Poteau.

Continuing south on the Kansas City, Pittsburg and Gulf, no coal is found or known in workable vein until the Mitchell Basin is reached, about 8 miles south of Poteau, which field is now being opened and developed by the Choctaw, Oklahoma and Gulf Railway Company and the Choctaw Coke Company. The coal at this point consists of two veins, separated by about 40 feet of slate and rock, the upper vein being $3\frac{1}{2}$ feet thick, the lower one 4 feet thick. These veins are continuations of the Braidwood veins, the coal at Braidwood and Bryan having a dip of about 40 degrees. In the Mitchell Basin, however, the veins become flatter and at places the dip is as low as 12 degrees, but this occurs mostly at points where the crop of coal and the ridges make turns consequent upon the upheavals of Poteau and Sugar Loaf Mountains, directly east of the Mitchell Basin. At a point 1 mile south of Heavener, the Kansas City, Pittsburg and Gulf road opened both of these veins just mentioned, but at this point the irregularities of the formation, with the faults consequent thereto, render the working of the coal unprofitable, although this same vein is workable and commercially valuable at other points. Continuing south no other vein of coal is found of any consequence, except a very thick vein found at or near the top of the Black Fork Mountains east of Page, and which vein is some 1,200 feet above the level of the track and about 3,000 feet distant, this vein showing to be about 25 feet thick, very friable, and very high in fixed carbon. The measures in the mountain are not regular, having a dip to the south of about 70 degrees. At a point where this coal crops it has been opened in the crop, showing the thickness above stated, and about 40 feet below the crop a tunnel has been driven through the rock overlying the coal, which shows to be 25 feet thick, the coal showing about the same thickness as at crop. Gangways were driven at right angles to the vein, and these gangways suddenly run up against solid rock on both sides, it appearing that in the upheavals or disturbances the rock had squeezed out the coal. The friable character of the coal, together with the formation of the district and the consequent expense of driving other tunnels, discouraged the parties developing, and will probably deter further operations for the present at least.

The Choctaw, Oklahoma and Gulf Railroad Company have a line running east and west through the Territory, entering on its western line, near Earlbore, Okla., and has recently extended their line eastward to a point on the Kansas City, Pittsburg and Gulf road named Howe. This road is developing coal and sinking a shaft in the Mitchell Basin, about 2 miles southwest of the junction of the Choctaw, Oklahoma and Gulf and the Kansas City, Pittsburg and Gulf railroads.

This road, on its way west from Wister, passes over an almost continuous coal field from there to South McAlester, in the valley extending from Caston Creek to the tank west of Panola, the coal cropping at the base of the ridge dipping to the north and being from 30 to 34 inches in thickness. In the valley south of this is found the Braidwood coal crop, running parallel to the Choctaw road and about $1\frac{1}{2}$ miles distant on the south. At the tank above mentioned the road crosses to the south and enters the valley carrying the Braidwood and Wilburton coals, and continues parallel with the crop about 4 miles, when it crosses the crop and runs through Limestone Prairie to Hartshorne. The coals at this point consist of two veins, separated by about 50 feet of strata, the upper vein being from 4 to $4\frac{1}{2}$ feet in thickness, the lower vein from $4\frac{1}{2}$ to 5 feet in thickness.

The Ola Coal and Mining Company have two mines opened about one-half mile west of a water tank on the Choctaw, Oklahoma and Gulf Railroad, which tank is about 5 miles east of Wilburton. About $1\frac{1}{2}$

miles east of these mines the Wilburton Coal and Mining Company have also two mines opened. Adjoining their property on the west James Degnan & Co., known as the McAlester Coal and Mineral Company, have two slopes opened in the town of Wilburton and on the curve where the Choctaw, Oklahoma and Gulf road crosses the crop of coal. The Choctaw road then passes for several miles over Limestone Prairie, under which no coal has yet been found, crossing the crop of the coal again about 4 miles east of the town of Hartshorne, near which point the Choctaw, Oklahoma and Gulf mine shaft No. 3 is about to be connected with a switch from the main line. The railroad then runs continuously over a coal field to within 1 mile of South McAlester, passing shaft No. 1 at Hartshorne, the Grady strip pits, and the Hailey Coal and Mining Company, a new operation, about $1\frac{1}{2}$ miles west of the town of Hartshorne.

The railroad then passes the Milby and Dow shaft No. 9, which has been recently sunk and is now being developed further, then passes the two mines of the Choctaw, Oklahoma and Gulf Railroad at Alderson Nos. 1 and 7, and near which is located the plant of the Choctaw Coke Company. No more coal is found or operated on the Choctaw road west of this point. The road, however, crosses the crop of the coal on the north side of the field at a point west of South McAlester.

The St. Louis and San Francisco road enters the Territory at Jenson, running in a southwesterly direction to Arthur City, on Red River, in Texas, crossing the crop of the Hackett City coal 2 miles south of Jenson, this coal being 3 feet in thickness, with a dip to the south of about 15 degrees. At the town of Poteau a branch road into Cavanal Mountain, about 3 miles distant from the main line, reaches the Cavanal Mountain vein, operated by the Cavanal Coal, Coke and Railway Company. At this point there is a vein of coal 4 feet in thickness, with a dip of about 10 degrees toward the center of the mountain, with an elevation above the main track of about 400 feet. At Cavanal Station, on the main line, 6 miles farther south, a vein of coal 3 feet in thickness has been found, and operated only to a small extent, the coal being filled with sulphur and not a very good quality. About 7 miles south of this point it strikes the crop of the Braidwood and Wilburton coals, and runs parallel with the crop for about 4 miles, there being two veins at this point, the upper one $3\frac{1}{2}$ feet in thickness, the lower one 4 feet, dipping at an angle of 40 degrees to the north. No more coal is found at or near the main line of the St. Louis and San Francisco road until the town of Antlers is reached, near which point is the vein known as the Jumbo Vein. The development of this coal and trial of it has resulted in ascertaining that it is of very friable character and light in fixed carbon, consequently not being well suited to bear transportation, and being of but little commercial value, it has been impossible to work this vein practically up to the present time. This vein is about 25 feet in thickness, is very irregular in formation, and is 12 miles from the main line of the St. Louis and San Francisco Railway. No other coal has yet been discovered in the Indian Territory south of this point.

The St. Louis and San Francisco Railroad has a branch line entering the Territory at Seneca, Mo., running southwest through the town of Vinita, thence running southwest to a town named Tulsa, on the banks of the Arkansas River, and proceeding in the same direction to the town of Sepulpa, which is now its terminus. This road is now being extended, and by September trains are expected to be run to Oklahoma City in Oklahoma Territory. Along this line, from Vinita to its present terminus, coal is found along under the high spots of ground varying from 18 to 34 inches in thickness. No large operations have been commenced

on this road, but quite a considerable amount of coal has been taken out from the crop at various points by strip pits.

The Missouri, Kansas and Texas Railroad enters the Indian Territory just south of the town of Chetopa, in the State of Kansas, runs in a southerly direction, running a little to the west to the town of Denison, in Texas. The first coal found on this road is near the town of Vinita, at which point a small amount of coal has been taken out by strip pits and hauled to Vinita in wagons. The coal at this point is from 18 to 24 inches thick. The next evidences of coal are found near the town or Checotah, at which point there is a vein of about 3 feet in thickness, with a lot of dirt in its center.

The next coal is found at the town of McAlester, at which point the road crosses the crop of McAlester coal, the vein being 4 feet in thickness and having a dip of about 25 degrees to the south. Near the town of McAlester, on the west side of the track, are two mines, one operated by D. Edwards & Son and the other by Noah Samples, this coal being hauled to the town of McAlester on wagons. In an easterly direction from the town of McAlester the Missouri, Kansas and Texas have a branch railroad about 9 miles in length, which branch road passes first the Long Wall mine of the Osage Coal and Mining Company, known as No. 5, the shaft being 500 feet in depth. At this point the coal is about 4 feet in thickness, with a dip of about 15 degrees. The next point reached is a small slope operated for the above company by Robert Church. Proceeding eastward, Mine No. 11 of the Osage Coal and Mining Company is reached, at which point the coal is some 4 feet in thickness, having a dip to the south of about 12 degrees, this shaft being 411 feet in depth. To the east is No. 10 mine of above company, which mine has been in operation for a number of years and is now connected with No. 11, the coal at this point being of about the same thickness as at Mine No. 11.

In the vicinity of No. 10, and connected with the branch road of the Missouri, Kansas and Texas, are a number of small slopes and drift pits, a description of which will be found under the head of the Osage Coal and Mining Company. From this point the road runs a little north of east to the town of Cherryvale, at or near which town are the mines Nos. 50 and 52 of the Kansas and Texas Coal Company, the coal being 3½ feet in thickness, with a dip to the north of about 20 degrees.

Returning to the town of McAlester and following the Missouri, Kansas and Texas southwesterly, a crop of coal is found at or near the town of Savanna, which is the southwesterly edge of the McAlester vein; but at this point, owing to upheavals and other disturbances, the coal lies at a considerable angle, dipping about 60 degrees to the north, the road and crop running almost parallel for considerable distance to about 3 miles south of Savanna, at which point the road crosses the crop, and the coal then turns more to the west of the railroad in the direction of Coalgate and Lehigh. The coal at or near Savanna is about 4 feet in thickness. Owing to the steepness of this coal, very great difficulty has been found in operating and producing the coal profitably, and there has been a great number of changes in the parties operating in this field, a large amount of money expended, and little practical success attended. The present operator in this field is the Kiowa Coal and Mining Company, which company operates the several slopes at Savanna and one at Fairview. Between Savanna and Fairview, at a place called Johnsville, large operations have been had, expensive machinery has been put in, and several attempts made to work the coal profitably during the current year. This mine has been abandoned, the machinery taken away, and all operations have ceased.

From the town of Atoka, on the Missouri, Kansas and Texas Railroad, a branch line has been in operation for several years, and about four or five miles along this road, and northwest of Atoka, a large amount of coal has been taken out of strip pits in the years past. Nine miles from Atoka is the town of Lehigh, at or near which the mines Nos. 5 and 6 of the Atoka Coal and Mining Company are now in operation, the coal at this point being about $4\frac{1}{2}$ feet in thickness, with a dip of about 8 degrees. Three miles beyond the town of Lehigh is the town of Coalgate, at or near which point the Southwestern Coal and Mining Company are now operating shafts Nos. 4, 5, and 6, the coal being about $4\frac{1}{2}$ feet in thickness, with a dip of about 8 degrees. A number of small operators have also taken out considerable coal at Coalgate, and some of them are at the present time operating near the said town. Returning to the town of Atoka and proceeding southward through the Territory on the Missouri, Kansas and Texas, no further discoveries have been made, and the evidences are that there is no more coal south of this point, the principal vein of coal traversing the Choctaw Nation running in general direction southwesterly and leaving the Missouri, Kansas and Texas at the towns of Coalgate and Lehigh, and proceeding in a southwesterly direction until again found on the Atchison, Topeka and Santa Fe at or near Ardmore.

The Atchison, Topeka and Santa Fe Railroad Company operate a railroad which enters the Territory near Purcell, in the Chickasaw Nation, and proceeds in a general southerly direction to the town of Gainesville, Tex. The only coal that has been discovered near this railroad was discovered some years ago about 3 miles east of the town of Ardmore. This vein was found to be about 4 feet thick, consisting of two members, the bottom one being about 15 inches thick and the top member 9 inches, with a strata of dirt about 2 feet in thickness between the two. Large amounts of money were expended in putting in branch railroads and valuable machinery, sinking slopes, and other improvements with the expectation of being able to produce a merchantable coal profitably. But after much outlay it was found that this coal was of such a poor quality and the expense of handling the dirt between the two members of the vein so great that the branch railroad has been taken up, the mine abandoned, and the machinery lies there rusting.

The following companies have been operating in the Indian Territory during the year past:

Name of company.	Location.
1. Choctaw, Oklahoma and Gulf Railway Co.....	Hartsborne, Alderson, and Gowen, Ind. T.
2. Southwestern Coal and Improvement Co.....	Coalgate, Ind. T.
3. Atoka Coal and Mining Co.....	Lehigh, Ind. T.
4. Osage Coal and Mining Co.....	Krebs and McAlester, Ind. T.
5. Kansas and Texas Coal Co.....	Cherryvale, Ind. T.
6. McAlester Coal and Coke Co.....	Krebs, Ind. T.
7. Milby and Dow Coal Co.....	Hartsborne, Ind. T.
8. Cavalal Coal, Coke and Railway Co.....	Poteau, Ind. T.
9. Kiowa Coal and Mining Co.....	Savanna and Fairview, Ind. T.
10. McAlester Coal and Mineral Co.....	Willburton, Ind. T.
11. Noah Samples.....	McAlester, Ind. T.
12. Ola Coal Co.....	Willburton, Ind. T.
13. Willburton Coal and Mining Co.....	Do.
14. Perry Bros.....	Coalgate, Ind. T.
15. D. Edwards & Son.....	McAlester, Ind. T.
16. Folsom Coal Co. (J. B. McDougal).....	Coalgate, Ind. T.
17. Western Coal and Mining Co.....	Bullcreek, Ind. T.
18. Savanna Coal, Mining and Trading Co.....	Savanna, Ind. T.
19. Sundry strip pits and mines.....	Creek Nation.
20. Hally Coal and Mining Co.....	Hartsborne, Ind. T.

CHOCTAW, OKLAHOMA AND GULF RAILWAY COMPANY.

Officers.—Francis I. Gowen, president, Philadelphia, Pa.; Henry Wood, general manager, South McAlester, Ind. T.; Edwin Ludlow, superintendent of mines, Hartshorne, Ind. T.

HARTSHORNE MINE NO. 1.

This mine is now in the ninth year of its existence and the workings are very extensive. The shaft is 201 feet deep. The mine has a capacity of over 1,300 tons per day, and has employed an average of 365 men during the past year.

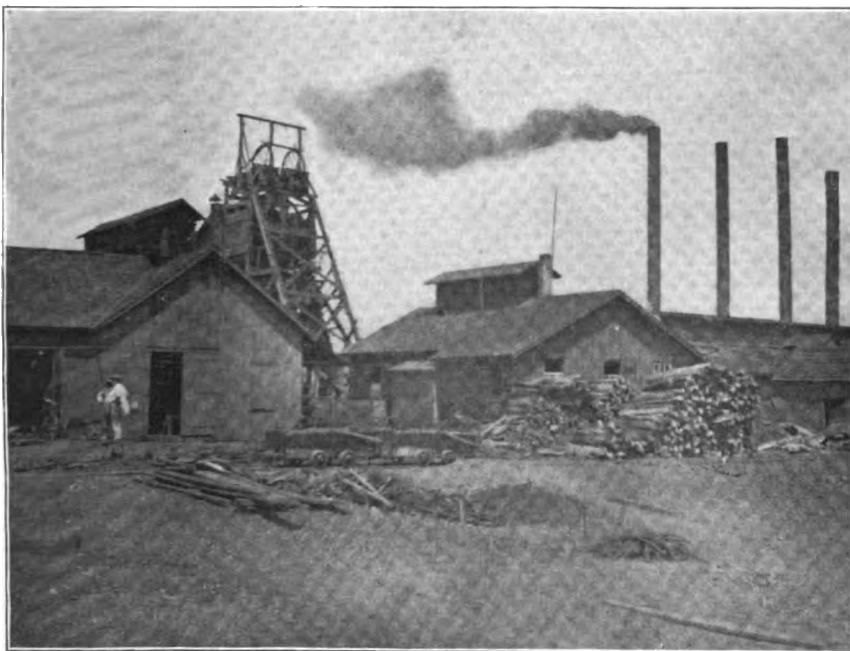
The plane near the foot of the shaft is still used as an upcast for ventilation. The plane driven off the main south entry is used for lowering coal to the entry named. An electric haulage system has been adopted for conveying the coal from the foot of the slope last mentioned to foot of shaft. This haulage system, which has a capacity of 25 pit cars per trip, is furnished with power by a 100-horsepower engine and 100-horsepower dynamo contained in a substantial engine house furnished with all necessary appliances, as rheostat, ammeter, etc., the dynamo also furnishing power for two electric mining machines and an electric pump, and preparations are now being made for an electric haulage on north side of shaft. There is also a slope off the north entry with four lifts, and a plane off the same entry with three lifts. The main north and the main south entries have been extended a considerable distance.

This mine is equipped with first-motion double-hoisting engines, 16 by 32 inch cylinder, and 8-foot drum. The plane driven off main south entry has a pair of geared double-hoisting engines, 16 by 32 inch cylinders, to lower coal to foot of shaft. A pair of first-motion 16 by 32 inch cylinders and 8-foot drum are set about 300 feet from top of shaft at a drill hole, through which a rope passes down slope for hauling coal to north entry, where it is dropped to foot of shaft. At a drill hole some 1,800 feet from main shaft are a pair of geared hoisting engines, which, by a rope passing down a drill hole, deliver the coal along the plane to north entry, whence it is delivered to foot of shaft. There is an electric pump at foot of slope which forces water to foot of shaft, whence it, together with the water that accumulates from the higher workings, is thrown out by three steam pumps located at sump at foot of shaft. The slope near foot of shaft has been extended considerably during the past year. Two electric mining machines are in use at this mine.

Safety catches in this mine are of approved pattern. Cages are self-dumping, and provided with overhead covers for the protection of men.

The Guibal fan supplying this mine with the necessary air was destroyed by fire two years ago, but was promptly rebuilt, and was in working order three days after the fire. It provides the mine with about 70,000 cubic feet of air per minute, which is abundant for the requirements of the law. The hoisting shaft and the plane near the foot of the shaft are used as escapements, and traveling ways are well kept up.

Proper metal speaking tube is provided. The thickness of the coal averages about 4 feet, but varies considerably in thickness at different points in the mine. The mine produces considerable fire damp. James Kern is mine boss. The distance to the face of the coal has been increased considerably during the past year, and while this circum-

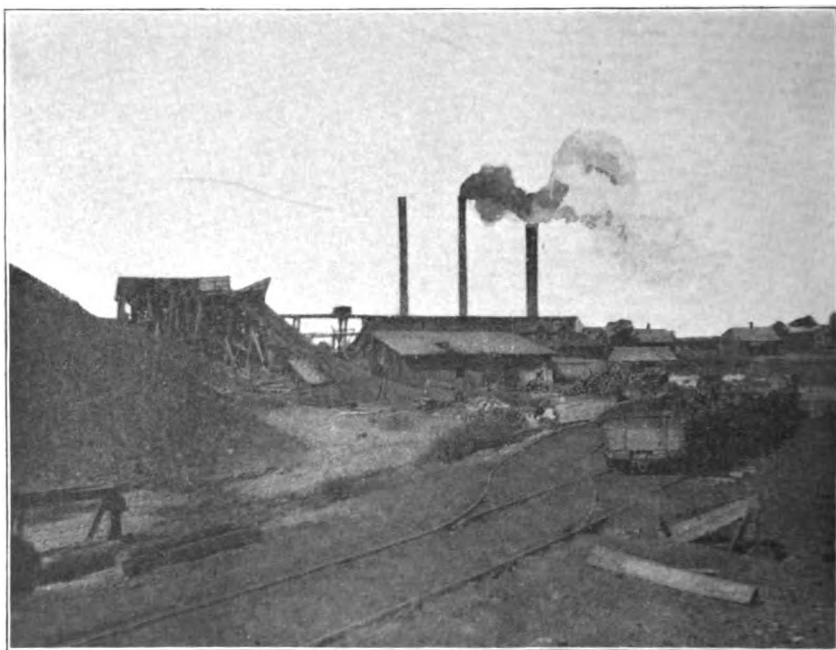


FRONT VIEW.

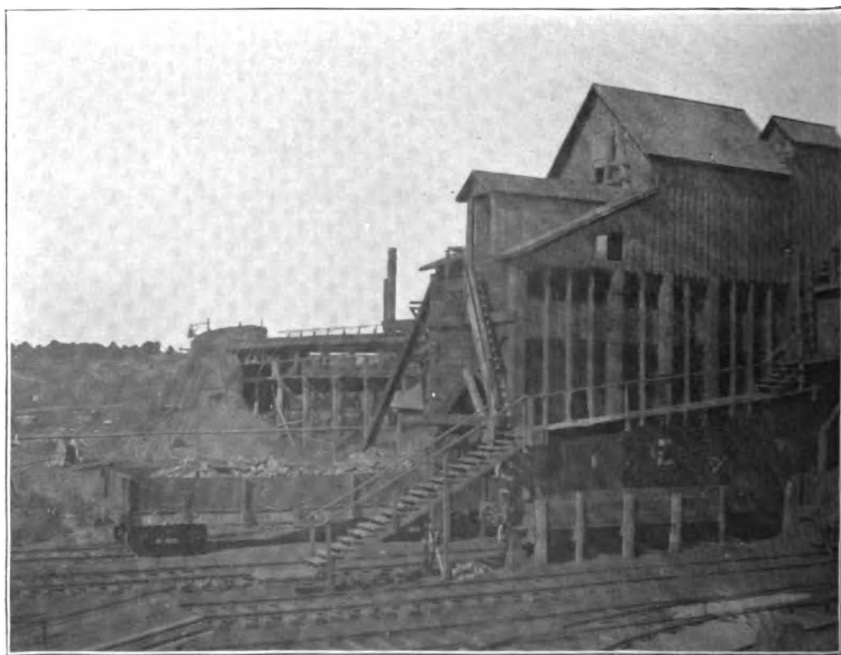


SIDE VIEW.

HARTSHORNE No. 1.



ALDERSON MINE NO. 1.



ALDERSON MINE NO. 7.

stance has increased the distance to be traveled, this additional cost has been overcome by more modern system of haulage, electric and otherwise. There have been six accidents at this mine, three of which have been fatal.

GOWEN MINE NO. 2.

This mine was located at Gowen, about 3 miles north of Hartshorne, on the Choctaw, Oklahoma and Gulf Railway. A large quantity of coal has been taken out of this mine in past years, but the mine was abandoned in February last owing to the faulty condition of the vein, the machinery and houses having been removed to Mine No. 3.

There have been eight accidents at this mine during the past year, three of which have been fatal.

MINE NO. 3.

This mine is located about 5 miles east of No. 2 mine and about 2 miles north of the main line of the Choctaw, Oklahoma and Gulf Railway and east of the town of Hartshorne.

This shaft was sunk about eight years ago and a track laid out from the Choctaw, Oklahoma and Gulf Railway, about 3 miles in length, and machinery had been placed. Owing to the financial condition of the company at that time, it was deemed best to abandon the shaft and use the machinery at other points. The depth of the shaft is 254 feet and entries are driven in about 100 yards on each side of the shaft. The shaft is about 3,000 feet from the north crop, and about 4,000 feet from the east crop. A slope has been started from the crop of the coal and driven toward the shaft, which when connected will make an escapement for the men. The coal will be delivered from this slope to the foot of the shaft. A tippie is being erected, machinery set, houses built, and track laid. Work is being pushed with vigor, preparing for a large output at this mine. There have been no accidents at this mine to date. John Madill is mine boss.

ALDERSON MINE NO. 1.

There has been very little change in this mine since my last report. The slope is now 3,100 feet in length, and is connected with Slope Mine No. 7. The method of handling the coal is by hauling the product to No. 7 mine, by mules over tramway, and loading the same at that point over a Mitchell tippie. There is a plane about 1,500 feet from the main entry on the fifth lift east driven toward the crop of the coal, and considerable coal is taken down this plane. Ventilation is had by means of an 18-foot fan at the head of the ventilating shaft east of slope. A large compressor furnishes air for the mining machines and also for machines in Mine No. 7, and these machines assist the ventilation and aid the safety of the miners. This mine is very dry and dusty, and produces considerable gas or fire damp. Engines are first-motion double engines, with 16 by 30 inch cylinders and 8-foot drum. Steam is furnished by a battery of six boilers, which also furnish steam for fans, compressors, and other machinery. Shot firers are employed in this mine, and considerable sprinkling is done to reduce and lessen the danger from dust and blown-out or windy shots.

A. W. Breckenridge is mine boss. There have been during the past year five accidents, one of which has been fatal.

ALDERSON SLOPE MINE NO. 7.

This mine is located about 4,000 feet west of the Choctaw, Oklahoma and Gulf depot at Alderson. It is in about the same condition as in my last report, except that the slope has been sunk two more lifts and it has entirely surrounded and absorbed the mine formerly known as the Sample slope, and it is now practically but one mine. Ventilation is had by an air shaft sunk near slope with a 12-foot fan. Mining is done by machinery—Ingersoll machines, which are compressed air mining machines, being used. A portion of the work, however, is done by hand labor. The air for these machines is brought from the large compressor at Mine No. 1. The system of having the man who loads the coal from the machine fire the shots is still in operation—the shots being fired at noon and night—and this system as before stated would seem to be reasonably safe if not absolutely so, so long as shots are properly placed and small charges of powder used. The coal is hoisted from this mine by means of 24 by 36 direct acting double hoisting engines with battery of boilers. Proper escapements and traveling ways are maintained, and the mine is fairly well ventilated. George Wheeler is mine boss. There was seven accidents at this mine during the past year, three of which proved fatal.

I append hereto copies of letters from Superintendent Ludlow, giving production and other statistics of mines of the Choctaw, Oklahoma and Gulf Railway Company.

HARTSHORNE, IND. T., *January 17, 1898.*

DEAR SIR: As requested in yours of January 5, I give below statement of output and average number of men employed at the different mines of this company for the six months ended December 31, 1897:

	Tons.	Average men.
Shaft No. 1, Hartshorne	109,054.19	414
Shaft No. 2, Gowen	29,505.5	156
Slopes 1 and 7, Alderson	85,359.7	343
Strip pits	6,772.8	.....

Milby & Dow Coal and Mining Company, Slope 9, March 27 to December 31, 1897, 10,429.17 tons.

Trusting same is information you desire, I am, yours, truly,

E. LUDLOW,
Superintendent of Mines.

L. W. BRYAN, Esq.,

United States Mine Inspector, South McAlester, Ind. T.

HARTSHORNE, IND. T., *July 16, 1898.*

DEAR SIR: In reply to your inquiry of July 2, take pleasure in stating that the tonnage of the mines of the Choctaw, Oklahoma and Gulf Railroad for the six months ended June 30 were as follows:

	Coal shipped.	Coal used at mines.	Days worked.
	Tons.	Tons.	
Hartshorne, No. 1 shaft	113,554.02	3,000	105½
Alderson, Nos. 1 and 7 slopes	77,067.01	3,000	96½
Strip	10,181.05	.....	.....
Gowen, No. 2 shaft	13,437.06	1,500	41½
Total	214,239.14	7,500	.....

This makes the shipments for the fiscal year ended June 30 as follows:

	Coal shipped.	Used at mines.	Total mined.	Days worked.
	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	
Hartshorne shaft, No. 1.....	222, 639. 01	6, 000	228, 639. 01	213½
Alderson, Nos. 1 and 7 slopes.....	162, 626. 08	6, 000	168, 626. 08	198½
Strips	16, 963. 08		16, 963. 08	
Gowen shaft, No. 2.....	42, 942. 11	8, 000	45, 942. 11	106½
Total	445, 161. 08	15, 000	460, 161. 08	

The company found it necessary in February to abandon No. 2 shaft at Gowen, owing to the faulty condition of the vein at that point. The machinery, houses, etc., have been moved to the No. 3 shaft of the company 5 miles farther east. The No. 3 shaft is sunk to the coal, a distance of 254 feet, and entries driven in about 100 yards on each side of the shaft. A slope has also been started from the surface and is now down 400 feet and the first-lift entries are being turned.

This shaft is located in the synclinal axis of the Grady Basin, where the outcrop changes from an east-and-west to a north-and-south course. The shaft is 3,000 feet from the north outcrop and 4,000 feet from the east, and by a slope on either side a large body of coal will be opened that will make this shaft a heavy producer for a number of years. The vein at this point has an excellent sandstone roof and the quality of the coal is the best that has been opened on the Hartshorne or Grady vein. The thickness varies from 3½ to 5½ feet, and the dip at the outcrop is about 5° and at the bottom of the shaft is practically level.

The work of opening and fully equipping this No. 3 shaft is about the only important improvement that this company is now making.

Yours, truly,

EDWIN LUDLOW,
Superintendent of Mines.

L. W. BRYAN, Esq.,
United States Mine Inspector, South McAlester, Ind. T.

RULES GOVERNING THE MINES OF THE CHOCTAW, OKLAHOMA AND GULF RAILROAD COMPANY.

1. Miners or other workmen engaged in the mine shall read, and such as can not read shall have these rules read to them, and all persons engaged in the service of the company must be governed by these rules and regulations.

2. All miners must be in the mines before the 7 o'clock whistle blows in the morning. Drivers must have their mules out of the stables and all other company men must be prepared to start work when the whistle blows at 7 o'clock.

3. Miners must be careful in building lumps of coal on their cars so as to prevent loss to both miners and company by coal falling off and causing wreck on slope.

4. That when any grievance may arise the party having the grievance must first try and adjust it with the pit boss; should they fail to adjust it they will refer it to the superintendent of the mines, whose decision shall be final.

5. Any employee feeling aggrieved in any respect must present his grievance to the pit boss in person, and shall not stop work by reason of any grievance while the matter is being adjusted; and all matters shall be adjusted outside of working hours.

6. That any person found with tools or powder belonging to another or taking or using tools or powder belonging to another without the owner's consent shall, for the first offense, be fined \$2.50, and for the second offense be discharged; such fines to be paid to the owner of the tools and collected at the company's office. And any person detected in changing checks on the pit cars shall be immediately discharged.

7. All persons employed in the mines are strictly forbidden to ride up or down the slopes on the trips, and all men that may require to leave the mine while hoisting is being done must travel out the manways.

8. Miners are strictly forbidden from going into the next room for safety when firing a shot, but are required to go to a safe distance in the entry in order to be out of all danger.

9. Miners are strictly forbidden to fire a shot without giving warning of their intention to other workmen who may be near them, and must wait until all are at a safe distance.

10. All miners must run their loaded cars down their rooms to the parting but not out on the entry; the drivers shall pull the empty cars to the face of the pitch rooms; miners to make height for mules.

11. In all the mines, unless otherwise designated, the time for firing shots shall be at 12 o'clock noon when half time is being worked, and 5 o'clock evening when mine is working three-quarters or full time. Any employee detected in breaking this rule shall have his turn stopped for the first offense, and for the second offense shall be suspended for one week, for third offense will be discharged.

12. It shall be the duty of every miner to keep his room or working place well propped, in good order and repair, and keep it perfectly safe in every way; and any miner who shall willfully and negligently or carelessly suffer his room to get out of order and repair shall, upon request, put same immediately in repair, and if he does not the company will do the work required and charge the cost of the same to the miner.

13. All miners causing falls of rock, either by carelessness or the reckless use of powder, blowing out the timbers or damaging brattice, will repair the same at their own expense, or failing to do so, the company will repair, and charge the cost of the same to the miner.

14. When falls of rock take place in working places that have been properly timbered, a reasonable amount (to be agreed upon between the pit boss and the miners) shall be paid for cleaning up the same; but where the falls occur through the blowing out of props or careless timbering no allowance will be made for repairing.

15. In places where roofs are dangerous, and sufficient timber can not be secured, it shall be the duty of the workman or the miner to notify the pit boss at once and stop work until the timber can be obtained. All timber and rails will be furnished by the company to each working place at the point of delivery of empty cars after the miner has ordered the same.

16. All drivers must take proper care of their mules, and any driver known to abuse, mistreat, or injure his mules in any way will be discharged.

17. The fire boss (in mines where gas or fire damp is generated) or person acting in that capacity shall examine every working place in the morning before any miner or employee has entered the same, and shall mark the day of the month in some conspicuous place with chalk, which will be proof that he has examined the same, and under no circumstances must a miner or other employee enter a working place with an open lamp after being notified not to do so, or after finding a warning notice at the entrance of his working place.

18. It will be the duty of the fire boss, when he finds standing gas in any working place, to carefully dead line the same by making one, two, or three crosses with chalk plainly on a piece of board, the number of crosses to signify the amount of gas in the working place. If the standing gas is in a room, he shall place the dead line at the entrance to the same; if in an entry or air course, at a safe distance from the gas. The fire boss shall then notify the pit boss, who will see that the gas is carefully removed, so as to avoid accident; and any employee who shall knowingly or carelessly enter a place, with an open lamp, thus dead lined shall be immediately discharged.

19. Miners employed in places where explosive gas is generated shall be furnished with a safety lamp, and if for any cause they leave their working places for even a short time, before reentering again with an open lamp they shall first try the place with a safety lamp to see that no gas has collected during their absence.

20. No miner who has left the employ of the company or has been discharged from the same, shall be entitled to any pay or money due him until he shall have put his room in perfect working order, as required by the company. All miners leaving said employment will be required to procure the certificate of the pit boss that they have complied with the rule aforesaid before final payment or settlement shall be made.

21. If any miner shall leave an empty pit car in his room over night and the car should be lost or destroyed by the caving in of the room or the firing of a shot or through any other carelessness, the full value of the pit car shall be charged to him.

22. Any miner or employee who shall intentionally damage any signal bell or wire safety lamp, brattice, air way, or door, or open a door and not close it again, or do anything by which the safety of the men or the mine may be endangered shall be promptly discharged.

23. In the event of death by accident in the mines employees shall be allowed one-half day for the funeral. In all other cases any employee desiring to attend the funeral of a fellow-employee or a member of his family shall be at liberty to absent himself for that purpose after notifying the pit boss, but all other men shall be at work as usual.

24. No person shall be allowed to interfere with the employer's just right of employing, retaining, or discharging any person or persons whom the superintendent or mine boss having charge of the mine may consider proper, or to interfere by threats or

otherwise with the right of any employee to work in any way or open any terms and with whom he may think proper and best.

25. All powder will be delivered at the top of the shaft, after being ordered by the miner, and will be sent down by the company. The rope rider will be instructed to deliver it at the proper entries, but in no case will the company be responsible for powder lost after it has been delivered at the entry marked on the powder keg.

26. Miners in making up charges or cartridges of powder must put their lamps on the outside of their box and not less than 5 feet therefrom. Any miner found making charges or cartridges of powder with his lamp burning on his head shall, for the first offense, be suspended for three days, and for the second offense shall be discharged.

27. All miners must carefully remove all slate from their coal while loading it into their cars; any miner sending out slate in his coal cars shall for the first offense be docked 500 pounds, for the second 1,000 pounds, and for the third be suspended for one week.

28. The whistle will blow at 7 o'clock in the evening when the colliery will not work on the following day.

29. All employees who desire to absent themselves from work must notify the foreman under whom they work the day before. Anyone absent without permission will for the first offense be suspended three days, and for the second offense be suspended one week, and for the third offense be discharged. All miners absenting themselves three consecutive days without permission will be considered as having left the employ of the company and their places will be assigned to others.

30. All miners are strictly forbidden from leaving their working places to enter any vacant or unoccupied place without permission of the foreman. Any violation of this rule will be followed by an immediate discharge.

31. Anyone detected violating the above rules for which no penalty is named will for the first offense be suspended three days, for the second offense will be suspended for one week, and for the third offense will be discharged.

32. Any tenant of the company will be charged for any damage done to the house he occupies, and upon leaving its service, whether voluntary or by discharge, will not be entitled to receive any part of the wages due him until he shall have vacated the premises occupied by him and presented the keys of the same at the office, and the house has been examined and amount of damages deducted from his wages.

33. No meetings shall be held during the working hours of a hoisting day.

Entering the employment of the company is understood to be an acceptance of the foregoing rules.

EDWIN LUDLOW,
Superintendent of Mines.

SOUTHWESTERN COAL AND IMPROVEMENT COMPANY.

Officers.—A. A. Allen, general manager; I. M. Fleming, superintendent; D. C. Welch, auditor; R. P. Roach, cashier; mine superintendent, John Russell.

COALGATE MINE NO. 4.

This mine is in very much the same condition as when last reported, excepting that some extensions have been made. The shaft is 274 feet in depth and has a slope driven near the foot of the shaft, from which slope five lifts are being operated. At the head of the slope is an engine for the purpose of hauling coal to the foot of the shaft. A plane is also driven from near the foot of the shaft, which is opened out to the crop of the coal, on which four lifts are operated, an engine and boiler being stationed at the mouth, which lowers coal from these workings to the foot of the shaft. Direct acting double engines are used for hoisting with 16 by 24 inch cylinders and 8-foot drum. Steam is furnished for the machinery by a battery of four boilers.

Ventilation is had by a 12-foot fan at the air shaft, about 125 feet distant from the main shaft, which fan has a capacity of 35,000 cubic feet of air per minute, which is ample for the requirements of the law. Air course and traveling ways are kept in good condition. There are two methods of ingress and egress in addition to the hoisting shaft, one being about 600 feet from the main shaft, provided with suitable stairway and the plane heretofore referred to.

The capacity of this mine is about 800 tons per day, and it gives employment to 300 men. A small quantity of fire damp is produced and shot firers are employed. The requirements of the law are complied with. W. S. Miller is pit boss at this mine. There have been three accidents at this mine during the past year, two of which have been fatal.

COALGATE MINE NO. 5.

This mine has been one of the greatest producers of this Territory. The shaft is 60 feet deep, and has a slope and plane from which lifts are turned. Ventilation is had by a 12-foot fan, having a capacity of 35,000 cubic feet of air per minute, situated at the top of a shaft sunk about 150 feet from the main shaft, which is ample for all requirements. Escape can be had by this ventilating shaft or by way of No. 2 mine, with which there is a connection. Necessary stairways, traveling ways, and all requisite means of escape are afforded. This mine can produce fully 800 tons per day, and during the past year has given employment to 300 men. Thomas Jones is mine boss. There were two accidents at this mine during the past year, both of which were fatal.

FARRIMOND MINE.

This mine was flooded with water during the past spring and is now abandoned.

MINE NO. —. (New.)

This is a new mine about a mile north of Mine No. 5, the output only consisting of coal from the entries. The slope has been driven in some 1,500 or 1,600 feet, the intention being to sink a shaft to intersect the slope. Preparations are now being made to build a track to this mine and a large output is anticipated. No accidents to report.

I append letters from Auditor D. C. Welch giving the output of the Southwestern Coal and Improvement Company.

PARSONS, KANS., January 17, 1898.

DEAR SIR: Output of Colgate Mines belonging to this company for the six months ended December 31, 1897:

	Tons.
Screened coal.....	122,255.90
Mine run	27,953.75
Slack.....	38,996.50
Total.....	189,206.15

Average number of employees, including boys, 659.

Yours, truly,

D. C. WELCH.

MR. L. W. BRYAN,

United States Mine Inspector, South McAlester, Ind. T.

PARSONS, KANS., July 8, 1898.

DEAR SIR: Herewith statement showing output of our mines, number of men employed, and number of days worked for the six months ending June 30, 1898. Mr. I. M. Fleming, superintendent, will no doubt furnish you with additional information if he has anything to say.

Yours, truly,

D. C. WELCH.

MR. L. W. BRYAN,

United States Mine Inspector, South McAlester, Ind. T.

SOUTHWESTERN COAL AND IMPROVEMENT COMPANY,
Parsons, Kans., July, 1898.

Statement showing output of mines, number of men employed, and number of days worked for six months ended June 30, 1898.

	Tons.
Coal mined	163,407.50
Employees	570
Days worked, about	121

ATOKA COAL AND MINING COMPANY.

Officers:—Edwin Gould, president, New York, N. Y.; R. M. McDowell, vice-president and general manager, St. Louis, Mo.; A. M. Fellows, general salesagent, St. Louis, Mo.; William Cameron, superintendent; J. C. Cameron, cashier and assistant superintendent, Lehigh, Ind. T.

LEHIGH MINES NOS. 5 AND 5½.

But little change is to be noted in these mines since my last report, except the ordinary extension of the workings. No. 5½ shaft furnishes escapement, ventilation, and rope haulage for No. 5. There are suitable engines and boilers for the rope haulage, which rope haulage extends from the foot of No. 5½ shaft to the foot of No. 5 shaft. There is a slope with three lifts and a plane with two lifts at the foot of No. 5½ shaft, the coal from these lifts being delivered to the foot of No. 5 shaft by the rope haulage mentioned.

No. 5 shaft is 201 feet deep and is equipped with a pair of double engines with 12 by 24 inch cylinders. A battery of three boilers furnishes steam for all machinery.

At the foot of No. 5 shaft a slope is driven with five lifts, at the head of which is a single hoisting engine which handles the coal.

Ventilation is had by means of two 10-foot Crawford & McCrimmon fans placed at an upcast ventilating shaft situate about 200 feet from No. 5 shaft, and a 12-foot fan of same make at No. 5½. Abundant air is furnished to meet the requirements of the law, the system in this mine being that of splitting the air at each entry, which gives each entry the "first of the air" and abolishes the necessity of doors. Cages are self-dumping and are provided with safety catches and overhead covers.

Gates are furnished to landings, and all the requirements of the law are fully met. Five grades of coal are made at this mine, viz, lump, egg, nut, pea, and slack. As this mine is free from fire damp, no shot firers are employed. Capacity of mine, about 1,000 tons per day, giving employment to about 250 men. David Brown is mine boss. There have been three accidents at this mine during the past year, none of which proved fatal.

LEHIGH MINES NOS. 6 AND 6½.

The above mines are operated together. Owing to a fair demand for this coal, extensions have been considerable in this mine since my last report. All the hoisting is done from shaft No. 6. Five electric mining machines are now in successful operation. The main entry between Mine No. 6 and 6½ is now being graded and laid with 25-pound steel rail, it being the intention to use an electric locomotive to haul coal between 6 and 6½, to do the work at present being done by rope haulage. An electric shearing or cutting machine will also be installed in this mine, it being the design to "shear" or cut the coal in the center of the entries, a shot being placed in each rib.

Shaft No. 6 is 240 feet deep, and No. 6½ is 234 feet deep; the two shafts being about 4,000 feet apart and connected by the main north entry. No. 6 shaft is equipped with a pair of first-motion engines with 16 by 30 inch cylinder and 7-foot drum. Steam is supplied by a battery of six boilers for all machinery. Cages are self-dumping and provided with safety catches and overhead cover for the protection of men. Power for all electric machines is furnished by a Thompson-Ryan generator, manufactured by J. H. McEwan & Co., of Ridgeway, Pa., the generator being type B, 10 poles, 120 kilowatts, running 600 revolutions per minute, and capable of developing 200 horsepower, this generator being driven by a Watertown (N. Y.) engine, 15 by 16-inch cylinder, running 250 revolutions per minute, and capable of developing 200 horsepower.

The workings of this mine consist of a slope with five lifts and a plane. The plane is equipped with a single large hoisting engine, the plane being operated by gravity. Ventilation is had by a Crawford & McCrimmon fan placed on a ventilating shaft sunk to the rise of the coal and a 13-foot fan placed at the head of No. 6½ shaft. Ventilation in this mine is abundant and had a separate split of air for each entry, no trap doors being required.

Escapement is had by No. 6½ shaft, which is provided with stairway.

This mine produces no fire damp. Its capacity is about 1,000 tons of coal per day, and during the past year has given employment to 223 men. James Brown is mine boss at this mine. There have been two accidents during the past year at this mine, neither of which have proved fatal.

I attach copies of letters from Mr. J. S. Cameron, cashier and assistant superintendent, giving statistics of production and other valuable information.

LEHIGH, IND. T., *January 18, 1898.*

DEAR SIR: Below are the statistics asked for in your letter of 5th instant. You will note a marked increase in our production over the first six months of 1897, owing to a brisk fall trade, and we could easily have increased it 20,000 tons had we not experienced a scarcity of cars during October and November.

The mining machines in Mine No. 6 produced 23,610 tons of the total lump production at this mine in the six months ending December 31.

Please excuse delay in sending statistics, as I have been extremely busy since my installation here.

Yours, truly,

JAS. D. CAMERON,
Assistant Superintendent.

L. W. BRYAN, Esq.,
United States Mine Inspector, South McAlester, Ind. T.

Statistics for the six months ended December 31, 1897.

	Lump.	Mine run.	Nut.	Slack.	Total.	Days worked.	Average men.	Kegs powder used.
	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>			
Mine No. 5...	34,424.79	9,988.95	779.11	7,007.25	52,200.10	81½	240	1,531
Mine No. 6...	36,592.05	.....	1,625.28	10,065.70	48,283.03	84½	228	1,145
Total	71,016.84	9,988.95	2,404.39	17,072.95	100,483.18	82½	468	2,676

LEHIGH, IND. T., *July 15, 1898.*

DEAR SIR: In compliance with your request of the 2d instant I herewith submit to you statistics for the six months ending June 30, 1898, showing operations of the mines operated by this company.

During the last three months two new Jaffrey mining machines have been added

to the equipment of Mine No. 6. These, together with old machines, makes a total of five machines now successfully in operation in this mine.

Preparations are being made to install an electric cutting machine in this mine. This machine will cut the entries in the center from the top to bottom of vein, a shot being placed in each rib to blast the coal. The main north entry in Mine No. 6 is being graded and laid with 25-pound T iron for its entire length, nearly 4,000 feet, this work and equipment being necessary preparatory to the installation of an electric haulage motor to draw coal from No. 6½ shaft to No. 6 bottom.

No improvements have been made at No. 5 during the past six months.

Trusting that these are the statistics and information you desire,

I remain, yours, truly,

J. S. CAMERON,
Assistant Superintendent and Cashier.

L. W. BRYAN, Esq.,
Mine Inspector, South McAlester, Ind. T.

Statistics, six months ended June 30, 1898.

	Lump.	Mine run.	Nut.	Slack.	Total.	Days worked.	Average men.	Kgs powder.
	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>			
Mine 5	33,478.40	602.90	1,842.80	7,920.75	43,842.85	71½	239	1,365
Mine 6	35,901.50	.....	2,498.15	8,370.75	46,770.40	71½	239	990
Strips	2,105.25	.....	.....	.....	2,105.25	.....	24	40
Total ..	71,483.15	602.90	4,340.95	16,291.50	92,718.50	.....	468	2,395

Following are the rules in force in the mines operated by the Atoka Coal and Mining Company:

DUTIES OF MINERS.

Rule 1.—The miner shall each day examine his working place before beginning work, and take down all dangerous slate, or otherwise make it safe by properly timbering the same before commencing to dig or load coal, and he shall at all times be very careful to keep his working place in a safe condition during working hours.

Rule 2.—Should he at any time find his place becoming dangerous from any unusual condition that may have arisen he shall at once cease working and inform the mine boss or his assistant of such danger.

Rule 3.—Every miner shall order props, cap pieces, or other necessary timbers from the driver who brings him his cars. The miner shall always have on hand a sufficient quantity of props, cap pieces, and other necessary timbers, and shall order the same in advance, so that the driver may have time to bring them. Should the miner from any cause have no props or other necessary timbers on hand he shall immediately cease work, vacate his working place, and report the fact to the mine boss.

Rule 4.—No shot in rooms of full width shall be placed at a greater depth on the solid than the depth of the undermining. In all narrow work, such as entries, room turning, break throughs, etc., the coal must be sheared or cut on one side the full thickness of the vein and at least the full depth of the drill hole.

Rule 5.—Any miner who negligently blows out timbers and causes falls at his working face will be required to clear same at his own expense. The company will only assist at such clearing of falls when roof was known to have been bad or there was no negligence shown on the part of the miner.

Rule 6.—Any miner loading "bony" coal, or any foreign matter with his coal shall, for the first offense, be suspended one day; for a second offense be suspended one week, and for the third offense shall be discharged.

Rule 7.—Firing of shots shall take place but once daily, and shall commence at 5 p. m., at a signal to be agreed upon by the mine boss and miners. In case of mine working but half day, shots may be fired at 12 noon. Any miner firing before these hours shall be subjected to the same penalties as are specified in rule 6 for loading dirty coal.

Rule 8.—Blasting shall commence at first room on return airway, and shall be in rotation, ending on first room on intake airway, and rooms being turned shall wait until entrymen have fired.

Rule 9.—Miners firing a shot in break through or in rib, shall first warn miners working in next room that such shot is to be fired.

DUTIES OF DRIVERS.

Rule 10.—When a driver has occasion to leave his trip, or when his trip for any cause is stopped anywhere except at a regular station, he must see that it is left, when possible, in a safe place, secure from cars or other dangers, or from endangering drivers or trips following, and if the trip is left in a main hauling way he must go back and notify approaching drivers, if any, of the existing obstructions, that they may be enabled to stop their trips and avoid collisions.

Rule 11.—The driver must take great care in taking his trip down grade to have the sprags so adjusted that he can keep the cars under control, and thus prevent accidents.

Rule 12.—On receiving orders from workmen for props, cap pieces, or other necessary timbers, the driver will bring the same with all possible dispatch, and in case for any reason they can not be obtained, he will report the fact to the workmen so ordering, and also to the mine boss.

DUTIES OF ROPE RIDERS.

Rule 13.—The position of rope rider being one of peculiar hazard, he must use special care and precaution to avoid the dangers incident thereto.

Rule 14.—He shall exercise great care in seeing that all couplings are safe for use, and see that all trips are properly coupled before starting; and should he at any time see any material defect in the rope, link, hook, or chain, he shall immediately remedy such defect, or, if unable to do so, he shall detain the trip and report the matter to the mine boss.

DUTIES OF CAGERS OR MEN ASSIGNED TO THAT POSITION.

Rule 15.—The cager shall be at his proper place at the bottom of the shaft when men begin to descend in the morning and remain there until the hoisting of coal commences. He shall see that men are safely off the cage and then signal the engineer. He shall be at his proper place at the time the hoisting of coal ceases and men commence to be hoisted in the evening, and shall see that not more than eight persons get on the cage at any one time, and when they are safely on the cage, he shall signal the engineer to hoist them. The man acting as cager during the hoisting of coal shall see that all cars are safely held on cage by the catch provided for that purpose before signaling the engineer. He shall not allow any tools or material of any kind to be placed on the same cage with men or boys, nor on the opposite cage when men are being hoisted out of the mine or lowered into it, except when for the purpose of repairing the shaft or the machinery therein. The men shall place their tools in cars provided for that purpose, which car or cars shall be hoisted or lowered before or after the men have been hoisted or lowered; and he shall immediately inform the mine boss of any violation of this rule. In signaling the engineer the cager shall use the signals as directed in General Rule No. 30.

DUTIES OF TOPMEN OR MEN ASSIGNED TO THAT POSITION.

Rule 16.—He shall be at his proper place in the morning from the time that persons begin to descend into the mine, and shall remain there until the hoisting of coal commences. He shall see that not more than eight persons get on the cage at any one time, and when they are ready he will close the gate and signal the engineer to lower the cage; and he shall not open the gate until cage has been placed in position to receive men. After the hoisting of coal ceases in the evening it shall be his duty to be at his proper place until all the men are hoisted out of the mine. He shall see that men get safely off the cage, and shall then signal the engineer in the proper manner. He shall not allow tools or material of any kind to be placed on the same cage with men and boys, nor on the opposite cage when persons are being lowered into the mine, except for the purpose of repairing the shaft or the machinery therein. The men shall place their tools in cars provided for that purpose, which car or cars shall be lowered before or after the men have been lowered. In signaling the engineer the topman shall use the signals as directed in General Rule No. 30.

DUTIES OF ENGINEERS.

Rule 17.—It shall be the duty of the engineer to keep careful watch over his engine and all machinery under his charge, and see that the same is in proper working order before attempting to raise or lower men or material.

Rule 18.—He shall see that the boilers are cleaned and inspected at proper intervals, and that the steam pressure does not exceed at any time the limit allowed by the superintendent.

Rule 19.—He shall not allow any unauthorized person to enter the engine house; neither shall he allow any person to handle or run the engine without the permission of the superintendent.

Rule 20.—When workmen are being raised or lowered he shall take special precautions to keep the engine well under control.

Rule 21.—The engineer will observe and operate his engine in accordance with the general and special rules governing signals. (See General Rule No. 30.)

DUTIES OF FIREMEN.

Rule 22.—Every fireman or other person in charge of a boiler or boilers for the generation of steam shall keep a careful watch of the same. He shall see that the steam pressure does not exceed at any time the limit allowed by the superintendent. He shall frequently try the safety valves and shall not increase the weight on the same. He shall maintain a proper depth of water in each boiler, and if anything should happen to prevent this, he shall report the same without delay to the engineer and take such other action as may, under the particular circumstances, be necessary for the protection of life and preservation of property.

RULES AND REGULATIONS IN REGARD TO POWDER.

Rule 23.—No powder keg shall be opened in any other manner than by the slide or lead plug provided for that purpose. It is strictly forbidden to use a plug of any kind to drive through the end of a powder keg for the purpose of opening the same.

Rule 24.—Powder must be kept in a proper tight-locked box at a sufficient distance from the working face, such distance to be designated by the mine boss.

Rule 25.—Whenever a workman shall open a box containing powder or other high explosives, or while in any manner handling the same, he shall first place his lamp not less than 5 feet from such explosives, and in such a position that the air current can not convey sparks to it, and he shall not smoke while handling explosives.

GENERAL RULES.

Rule 26.—No person shall be allowed to enter any mine, except employees working in that mine, without permission of the superintendent.

Rule 27.—No person in a state of intoxication shall be allowed to go into or loiter about any mine.

Rule 28.—No person shall be allowed to travel on foot to or from his work on any incline, plane, or slope when other good roads are provided for that purpose. As each mine is provided with a passway round the shaft at the bottom, all persons employed in the mines, or others, are strictly forbidden to cross over from one side of the shaft to the other side, through the hoisting compartment, under any circumstances whatever.

Rule 29.—Workmen and all other persons are strictly forbidden to commit any nuisance or throw into, deposit, or leave coal, dirt, or stones or other rubbish in the air courses or roads so as to interfere with, pollute, or hinder the air passing into or out of the mine.

Rule 30.—In all shafts or slopes where persons, coal, or material of any kind are hoisted or lowered by machinery, the following code of signals shall be used:

One signal: To hoist coal or other material.

Two signals: To stop cage or car when in motion.

Three signals: That persons are to be hoisted; on hearing which the engineer will signal back "ready" by giving one signal. On hearing the last-named signal the persons will get on car or cage, and when they are safely on car or cage one signal shall be given the engineer to hoist. After the hoisting of coal has ceased in the evening and the 5 o'clock whistle has blown, it will only be necessary to give the first three signals for the first three cages of men, after which the one signal "ready" will only be given for each cage until all the men are out.

Four signals: That mules are to be hoisted; on hearing which the engineer will signal back "ready" by giving one signal. On hearing the last-named signal the

mule will be placed on the cage, and when it is safely on the cage one signal shall be given the engineer to hoist.

Five signals: Turn steam onto slope or underground engines.

Six signals: Shut steam off from slope or underground engines.

Rule 31.—No person or persons shall go into any old or abandoned part of the mine, or into any other place which is not in actual course of working, without the permission of the mine boss, nor shall they travel to or from their work except by the traveling ways provided and assigned for that purpose.

Rule 32.—No person in the mine shall be allowed to enter into any room or working place except the working place to which his duty calls him. It is strictly forbidden for any person to visit a room or other working place except his own, either during the presence or absence of its proper occupant. All boys or other persons assigned to special posts, as trappers or otherwise, must remain at their posts while on duty.

Rule 33.—All miners must be in the mine before the 7 o'clock whistle blows in the morning. Drivers must have their mules out of the stable and ready for work, and all other company men must be prepared to start work when the whistle blows at 7 o'clock.

Rule 34.—Any person found with tools or powder belonging to another, or taking or using tools or powder belonging to another person, without the owner's consent, shall for the first offense be fined \$2.50, and for the second offense he shall be discharged; such fines to be paid to the owner of the tools or powder, and collected at the company's office. Any person detected in exchanging checks on the pit cars shall be immediately discharged.

Rule 35.—Any miner or employee who shall damage any signal bell or wire, brattice, airway or door, or open a door and not close it again, or do anything by which the safety of the men or the mine be endangered, shall be promptly discharged.

Rule 36.—Whenever it shall be the duty of any person to go into the "sump," or space below the cage at the bottom of the shaft, for the purpose of cleaning out, removing dirt, or otherwise, they shall first place a prop or props of wood or iron in such a manner as to arrest the cage, should it from any cause be made to descend, and thus secure themselves or others from possible danger.

Rule 37.—All employees who desire to absent themselves from work must notify the foreman under whom they work the day before, and anyone absent without permission will for the first offense be suspended three days, and for the second offense be suspended one week, and for the third offense be discharged, except in case of sickness.

Rule 38.—All persons except those duly authorized are forbidden to meddle or tamper in any way with any electric or signal wire about the mine.

Rule 39.—No miner or other employee shall be entitled to receive his time at the company's office until he shall obtain from the mine boss a clearance card; and in case of employees renting a company house a note must be obtained from the superintendent's clerk stating amount of rent due.

Adopted July 24, 1897.

Approved:

R. M. McDOWELL,
General Manager.

WILLIAM CAMERON,
Superintendent.

ATOKA COAL AND MINING COMPANY, LEHIGH, IND. T.

NOTICE.

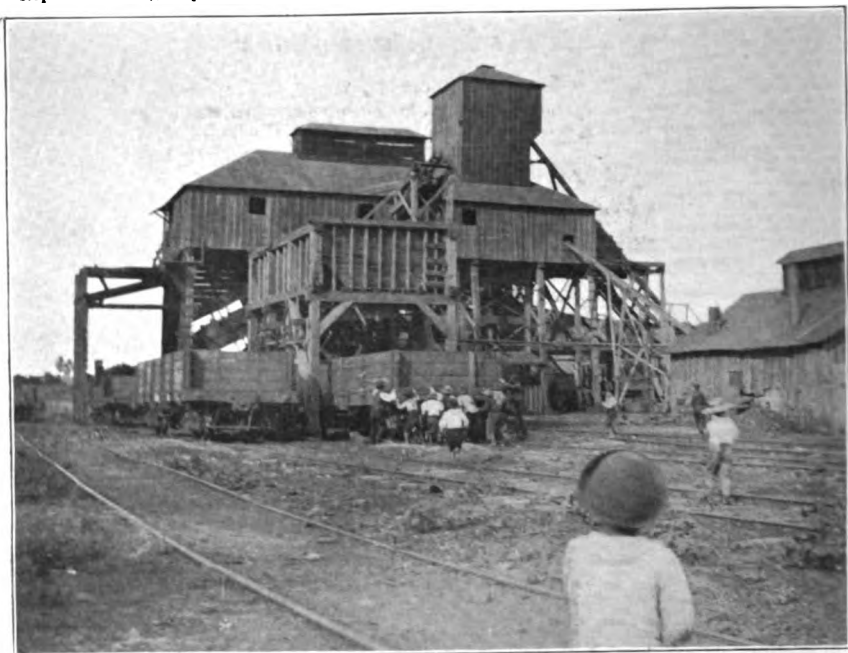
Miners are responsible for the safe and secure propping of the rooms in which they work, and each must see that his working place is carefully examined and made safe, in order to avoid accidents from falls of slate or coal.

Each employee must make himself thoroughly acquainted with all the rules of this company. He must strictly observe these rules and promptly report to the superintendent any infraction or disregard of the rules that comes to his notice.

Note and observe carefully all the rules and regulations in regard to powder and propping and otherwise making working places safe.

July 24, 1897.

WILLIAM CAMERON,
Superintendent.
R. M. McDOWELL,
General Manager.



NO. 11. OSAGE COAL AND MINING COMPANY, KREBS, IND. T.



NO. 5. OSAGE COAL AND MINING COMPANY, MCALESTER, IND. T.

OSAGE COAL AND MINING COMPANY.

Officers.—Edwin Gould, president, New York, N. Y.; R. M. McDowell, vice-president and general manager, St. Louis, Mo.; A. M. Fellows, general sales agent, St. Louis, Mo.; William Cameron, superintendent, Krebs, Ind. T.; T. W. Clelland, cashier, Krebs, Ind. T.

MINE NO. 5.

This mine is operated on the long-wall system, of which previous notice has been made, this being the first successful attempt to introduce this system in the Indian Territory, and it is gratifying to note that this mine is still being worked successfully. The face of the coal has been advanced considerably during the past year. During the past year some difficulty has been experienced with water, but by cutting the slope down past the line of the long-wall face a lodgment for the water was made, and this being removed by pumps, now keeps the working face clear of water. An electric locomotive for haulage purposes has been in use in this mine with success.

The shaft is 485 feet deep. Self-dumping cages with approved safety catches and overhead covers are provided. Upper and lower landings are provided with gates. Hoisting engines are first-motion double engines with 16 by 28 cylinders and 8-foot drum. Steam is supplied by a battery of six boilers, each 60 inches by 22 feet, which furnish steam for hoisting engines, fan engines, pumps, conveyors, electric dynamo, dynamo engine, and other machinery. Ventilating shaft and escapement, with a 15 foot Crawford and McCrimmon fan, furnished abundant air, and proper stairway is furnished for escape of men; traveling ways are in good condition. Metal speaking tube and all other requirements of the law are provided.

Coal is mined by two Sperry electric long wall mining machines, the necessary power being generated by a 175-horsepower Westinghouse dynamo, driven by an Ideal engine with 16 by 16 inch cylinder, the dynamo and engine house being furnished with the latest improvements for indicating the power, etc., of the electric machinery, with switchboards, rheostat, insulating brackets, Westinghouse round-dial ammeter and Weston round-dial voltmeter, mounted on marble slabs. The mine has a capacity of about 800 tons per day and employs about 150 men. H. H. Bosley is mine boss. The only accident occurring at the mines of the Osage Coal and Mining Company occurred at this mine, and was a slight accident.

KREBS MINE NO. 10.

In this mine the workings have been so extensive that the haulage is of great length, and the company is now arranging to make connection with No. 11 mine, the Entry O of that mine being extended to intersect the slope of No. 10, which slope is being driven down to meet the entry named. When this connection is made the coal will be hauled by rope haulage to mine No. 11 and the machinery at No. 10 will be removed, thus handling the whole product of the two mines at No. 11 shaft. The system of ventilation will then be changed, making No. 10 shaft the upcast and No. 11 the downcast for both mines. James Miller is mine boss. There have been no accidents at this mine during the past year.

KREBS MINES NOS. 11 AND 11½.

Mine No. 11 has been considerably extended during the past year. A large amount of mining has been done by electric machines. The slope has been sunk some 600 feet. Entry O is being rapidly extended

to a connection with the slope of No. 10 mine. In this entry a squeeze has taken place, which somewhat delayed the driving of the entry, but when the connection is once made through the results will doubtless be favorable to increased output. The system of ventilation will then be changed and No. 10 mine shaft will be the upcast for ventilating mine No. 11. K and M entries have been worked out and abandoned.

No. 11½ shaft is 230 feet deep and is equipped with a large hoisting engine furnished with steam by two boilers. Cage is provided with approved safety catches and overhead covers, and is especially used for hoisting men and material, being constantly held in readiness for that purpose. This shaft has two fans, one running continually and the other held in readiness for emergencies. Each of these fans has a capacity of 35,000 cubic feet of air per minute. Proper pumps are kept in order at No. 11½ to keep that portion of the mines clear of water.

No. 11 shaft is 470 feet deep. Cages are fitted with safety catches and overhead covers. Electric power is furnished by a 135-horse-power General Electric dynamo, which dynamo is driven by a 150-horse-power Ideal steam engine.

There are two electric pumps and one steam pump in this mine. A hoisting engine at the head of slope is used for hoisting coal from the various entries in the mine turning off the slope, and a plane engine for lowering coal from the entries on the plane. The foot of the shaft is lighted by electricity. Six boilers supply steam for all machinery.

Ventilation is abundant, being supplied by the fan at No. 11½ and also by a fan at old mine No. 7. Air courses are kept in good condition and proper stairway is provided. Numerous guideboards indicate the way of escape for the men in case of accident. Capacity of mine is 800 to 900 tons per day and furnishes employment for about 350 men.

William Strong is mine boss. There have been no accidents at this mine during the past year. All the requirements of the law are fully met and no pains are spared to keep this mine in excellent condition.

SLOPE MINES OF THE OSAGE COAL AND MINING COMPANY.

Four slope mines are now being worked, viz: Homer's, on crop above old No. 7; Carley's, on crop southwest of No. 10; Hughes's, on Edmund Pusley claim 2 miles northeast of Krebs, and Church's, about one-half mile west of coke yard. These slopes are all in good condition and comply with the requirements of the law. No accidents have taken place this year.

Appended hereto are copies of letters from Mr. William Cameron, superintendent of Osage Coal and Mining Company, relative to production, etc.

KREBS, IND. T., *January 6, 1898.*

DEAR SIR: The following is the tonnage produced at Osage Coal and Mining Company's mines at Krebs, Ind. T., for six months ended December 31, 1897, also average number of men employed for same period:

	Tons.
Mine No. 5.....	14, 896. 55
Mine No. 10.....	12, 484. 57
Mine No. 11.....	32, 068. 25
Slope mines	14, 164. 65
Total	73, 614. 02

Average number employees for six months, 650.

Coke manufactured for six months, 8,651. 20 tons.

The tonnage given above does not include coal made into coke.

Small tonnage is on account of slow work, our mines being practically at a standstill for several months during summer for lack of orders.

Any further information you may desire, please write us for same and we will gladly furnish same if possible.

Yours, truly,

WILLIAM CAMERON,
Superintendent.

L. W. BRYAN,
United States Mine Inspector, South McAlester, Ind. T.

KREBS, IND. T., July 13, 1898.

DEAR SIR: As requested in yours of July 2, I herewith send you a statement of the output and average number of men employed by the Osage Coal and Mining Company at Krebs, Ind. T., for six months ended June 30, 1898; also amount of powder used, coke manufactured, etc., for same period:

Screened lump coal	tons..	68,899
Nut coal	do...	1,599
Mine run	do...	145
Coal used in making coke.....	do...	18,761

Total.....	do...	89,404
Average number of men employed.....		575

Amount of powder used:

Saltpeter powder.....	kegs..	1,138
Soda powder	do...	1,334

Total.....	do...	2,472
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Average number of days worked for all mines for six months was 7 days each per month.

Amount of coke produced for six months, 9,839.20 tons.

No new openings have been made in the past six months.

One new electric coal-mining machine has been added to Mine No. 11, this making eight now in use at that mine, and two in Mine No. 5.

As you are aware, no accidents of any importance have occurred in the past six months.

Yours, truly,

WILLIAM CAMERON,
Superintendent.

L. W. BRYAN, Esq.,
United States Mine Inspector, South McAlester, Ind. T.

KREBS, IND. T., July 29, 1898.

DEAR SIR: Replying to your letter of the 28th instant asking for a statement of total average number of days worked by the men under my control for the year ending June 30, 1898, we gave you the average number of days the mines worked for six months ending June 30, 1898, but on looking back we find that we did not give you the average number of days worked for six months ending December 31, 1897, and I presume this is the information you desire, as we can not give you the average number of days the men worked but can give you the average number of days the mines were in operation. The following is the time worked for the year ended June 30, 1898:

Number of days worked at each mine.....	96
Average number of days per month worked at each mine.....	8

Trust this is the information you desire, if not let us know and we will furnish the same if possible.

Yours, truly,

WILLIAM CAMERON,
Superintendent.

L. W. BRYAN, Esq.,
United States Mine Inspector, South McAlester, Ind. T.

Following are the rules of the Osage Coal and Mining Company:

DUTIES OF FIRE BOSSES.

Rule 1.—Each fire boss shall enter the mine before the men have entered it, and before proceeding to examine the same he shall see that the air current is traveling in its proper course; and if he finds the air traveling properly, he shall then proceed to examine the workings.

Rule 2.—He shall not allow any person except those duly authorized to enter or remain in any part of the mine through which a dangerous accumulation of gas is being passed in the ventilating current from any other part of the mine.

Rule 3.—On entering the mines in the morning before the men have entered he shall proceed to examine the same and mark all rooms or working places in the following manner:

The day of the month, thus, 30, indicates that inspection has been made and that the room or working place is free from fire damp.

Two large crosses with the day of the month between them, thus, $\times 30 \times$, indicates the presence of fire damp and extreme danger. These marks must be made on a cap piece or other timber and laid in the roadway at mouth of room or entrance to working place.

Rule 4.—After complete examination has been made, he shall proceed to the bottom of the shaft and signal to the engineer that the workmen may now descend the shaft. In mines where there are more than one fire boss, each fire boss shall allow only such men as work in the portion examined by him to proceed to their working places, and shall detain all others until the arrival of the fire boss who has examined their working places. Should he have found explosive gas or fire damp in any of the working places, he shall personally notify the men working in such places as to the danger and warn them not to proceed to work until he has removed the danger. After notifying the men working in places where he has discovered fire damp, it will be his duty, as speedily as possible, to take the necessary steps to remove the fire damp and render the places safe for work. He will then notify each man that his place is now free from fire damp. In removing the fire damp, it will be his duty to see that the gas so removed will not be carried on to naked lights in the return stairway.

Rule 5.—It will be his special duty at all times to see that the air is moving in the proper manner; to look out for falls in the air courses and to remove them, if possible. Should the fall or falls be too large for him to remove personally he will notify the mine boss, whose duty it will be to assign sufficient force to have them removed as speedily as possible.

DUTIES OF MINERS.

Rule 6.—As quantities of explosive gas or fire damp are generated in these mines, the miner will take special care, in entering his room or working place, to notice the cautionary marks made for his protection, the marks being made on cap piece or other timber laid in the roadway at mouth of room or entrance to working place, the marks being as follows:

The day of the month, thus, 30, indicates that inspection has been made, and that the room or working place is free from fire damp.

Two large crosses with the day of the month between them, thus, $\times 30 \times$, indicates the presence of fire damp—extreme danger. In case the mark indicates the presence of fire damp, the workman shall not, under any circumstances, enter such room or working place until the fire boss has again inspected and rendered the place safe.

Rule 7.—The miner shall each day examine his working place before beginning work, and take down all dangerous slate or otherwise make it safe by properly timbering the same before commencing to dig or load coal, and he shall at all times be very careful to keep his working place in a safe condition during working hours.

Rule 8.—Should he at any time find his place becoming dangerous from any unusual condition that may have arisen, he shall at once cease working and inform the mine boss or his assistant of such danger.

Rule 9.—Every miner shall order props, cap pieces, or other necessary timbers from the driver who brings him his cars. The miner shall always keep on hand a sufficient quantity of props, cap pieces, and other necessary timbers, and shall order the same in advance so that the driver may have time to bring them. Should the miner, from any cause, have no props or other necessary timbers on hand he shall immediately cease work, vacate his working place, and report the fact to the mine boss.

Rule 10.—All coal must be undercut at least 2 feet in rooms, and no shot to be placed so the point of the shot or any part of the powder shall be more than 4 feet from the face or more than 2 feet beyond the undercutting. All entries or other narrow work under 12 feet wide to be undercut to full depth of holes drilled for blasting.

Rule 11.—In case timbers are blown out, causing falls at the working face, owing to the negligence of the miner, he will be required to clear such falls at his own expense. The company will only assist where the roof was known to have been bad or there was no negligence shown on the part of the miner.

Rule 12.—Any miner loading "bony" coal or any foreign matter with his coal shall for the first offense be suspended one day; for a second offense be suspended one week; and for the third offense shall be discharged.

DUTIES OF DRIVERS.

Rule 13.—When a driver has occasion to leave his trip, or when his trip for any cause is stopped anywhere except at a regular station, he must see that it is left when possible in a safe place, secure from cars or other dangers or from endangering drivers or trips following, and if the trip is left in a main hauling way he must go back and notify approaching drivers, if any, of the existing obstruction, that they may be enabled to stop their trips and avoid collisions.

Rule 14.—The driver must take great care in taking his trip down grade to have the sprags so adjusted that he can keep the cars under control and thus prevent accidents.

Rule 15.—On receiving orders from workmen for props, cap pieces, or other necessary timbers, the driver will bring the same with all possible dispatch, and in case, for any reason, they can not be obtained he will report the fact to the work man so ordering, and also to the mine boss.

DUTIES OF ROPE RIDERS.

Rule 16.—The position of rope rider being one of peculiar hazard, he must use special care and precaution to avoid the dangers incident thereto.

Rule 17.—He shall exercise great care in seeing that all couplings are safe for use and see that all trips are properly coupled before starting; and should he, at any time, see any material defect in the rope, link, hook, or chain, he shall immediately remedy such defect, and if unable to do so, he shall detain the trip and report the matter to the mine boss.

DUTIES OF CAGERS OR MEN ASSIGNED TO THAT POSITION.

Rule 18.—The cager shall be at his proper place at the bottom of the shaft when men begin to descend in the morning and remain there until hoisting of coal commences. He shall see that men are safely off the cage and then signal the engineer. He shall be at his proper place at the time the hoisting of coal ceases and men commence to be hoisted in the evening, and shall see that not more than six persons get on the cage at any one time, and when they are safely on the cage, he shall signal the engineer to hoist them. The man acting as cager during the hoisting of coal shall see that all cars are safely held on the cage by the catch provided for that purpose before signaling the engineer. He shall not allow any tools or material of any kind to be placed on the same cage with men or boys, nor on the opposite cage when men are being hoisted out of the mine or lowered into it, except when for the purpose of repairing the shaft or the machinery therein. The men shall place their tools in cars provided for that purpose, which car or cars shall be hoisted or lowered before or after the men have been hoisted or lowered. And he shall immediately inform the mine boss of any violation of this rule. In signaling the engineer the cager shall use the signals as directed in general rule No. 43.

DUTIES OF SHOT FIRERS.

(The rules governing shot firers apply only to mines worked on the room and pillar plan, such as mines Nos. 10 and 11, and do not apply to mines worked on the long-wall plan, such as mine No. 5.)

Rule 19.—Shot firers must not fire any shot unless coal is properly cut in accordance with the two following sections, nor unless said shot is otherwise and in all respects proper and safe:

Section 1. All coal must be undercut at least 2 feet in rooms, and no shot to be placed so the point of the shot or any part of the powder shall be more than 4 feet from the face or more than 2 feet beyond the undercutting.

Sec. 2. All entries or other narrow work under 12 feet wide to be undercut to full depth of holes drilled for blasting.

Rule 20.—Shot firers must fire only one shot at a time in any separate split of air, and the following shot must not be lit until the smoke has cleared away.

Rule 21. No shot to be fired while anyone except the shot firers are in the mines, except by special permission of the mine boss, and the shot firers shall not enter the mine for the purpose of firing until all the men are out of the mine.

Rule 22.—Shot firers must commence firing at a point farthest from the in-take air-way, and proceed with the firing in a direction opposite to that in which the air is traveling.

DUTIES OF TOPMEN OR MEN ASSIGNED TO THAT POSITION.

Rule 23.—He shall be at his proper place in the morning from the time that persons begin to descend into the mine and shall remain there until the hoisting of coal begins. He shall see that not more than six persons get on the cage at any one time, and when they are ready he will close the gate and signal the engineer to lower cage, and he shall not open gate until cage has been placed in position to receive men. After the hoisting of coal ceases in the evening it shall be his duty to be at his proper place until all the men are hoisted from the mine. He shall see that men get safely off the cage and shall then signal the engineer in the proper manner. He shall not allow any tools or material of any kind to be placed on the same cage with men or boys, nor on the opposite cage when men are being lowered into the mine, except for the purpose of repairing the shaft or the machinery therein. The men shall place their tools in cars provided for that purpose, which car or cars shall be lowered before or after the men have been lowered. In signaling the engineer the topman shall use the signals as directed in rule No. 43.

Rule 24.—At shafts not using self-dumping cages the topman shall see that the stops for cages to rest upon are kept in good working order, and he must remove loaded cars carefully, and in placing empty cars on cage must see that the car is securely held by the catch provided for that purpose before signaling the engineer.

DUTIES OF ENGINEERS.

Rule 25.—It shall be the duty of the engineer to keep careful watch over his engine and all machinery under his charge and see that the same is in proper working order before attempting to raise or lower men or material.

Rule 26.—He shall see that the boilers are properly cleaned and inspected at proper intervals, and that the steam pressure does not exceed at any time the limit allowed by the superintendent.

Rule 27.—He shall not allow any unauthorized person to enter the engine house; neither shall he allow any person to handle or run the engine without the permission of the superintendent.

Rule 28.—When workmen are being raised or lowered he shall take special precautions to keep the engine well under control.

Rule 29.—The engineer will observe and operate his engine in accordance with the general and special rules governing signals. (See General Rule No. 43.)

DUTIES OF FIREMEN.

Rule 30.—Every fireman or other person in charge of a boiler or boilers for the generation of steam shall keep a careful watch of the same. He shall see that the steam pressure does not exceed at any time the limit allowed by the superintendent. He shall frequently try the safety valves and shall not increase the weight on the same. He shall maintain a proper depth of water in each boiler, and if anything should happen to prevent this he shall report the same without delay to the engineer, and take such other action as may under the particular circumstances be necessary for the protection of life and preservation of property.

RULES AND REGULATIONS IN REGARD TO POWDER.

Rule 31.—All persons, except those appointed by the coal company or the mercantile company having charge of the powder sales, are prohibited from entering the powder house on any pretense whatever.

Rule 32.—The use of tobacco in any form by any person while in the performance of his duties in and around the powder houses is strictly prohibited; neither shall any person enter a powder house with matches or other ignitable material about his person.

Rule 33.—No powder keg shall be opened in any other manner than by the slide or lead plug provided for that purpose. It is strictly prohibited to use a plug of any kind to drive through the end of a powder keg for the purpose of opening the same.

Rule 34.—It will be the duty of those authorized, who perform this work, to see that no person enters the powder house while said work is in progress, also to govern their actions by the above regulations.

Rule 35.—No lights of any kind shall be allowed in or around the powder house.

Rule 36.—No powder or high explosives shall be taken into the mine by any one man in greater quantities than required for use in one day (unless such quantity be 5 pounds or less), and all powder shall be sent or carried into the mine in metallid canisters.

Rule 37.—Powder must be kept in proper air-tight powder cans, and the cans must be kept in a close tight locked box, said box to be at least 300 feet from any working face, and only at points designated by the mine boss.

Rule 38.—Whenever a workman shall open a box containing powder or other explosives, or while in any manner handling the same, he shall first place his lamp not

less than five feet from such explosives in such a position that the air current can not convey sparks to it, and he shall not smoke while handling explosives.

GENERAL RULES.

Rule 39.—No person shall be allowed to enter any mine, except employees working in that mine, without permission of the superintendent.

Rule 40.—No person in a state of intoxication shall be allowed to go into or loiter about any mine.

Rule 41.—No person shall be allowed to travel on foot to or from his work on any incline, plane, or slope when other good roads are provided for that purpose. As each mine is provided with a pass way around shaft at the bottom, all persons employed in the mine or others are strictly forbidden to cross over from one side of the shaft to the other side, through the hoisting compartment, under any circumstances whatever.

Rule 42.—Workmen and all others are strictly forbidden to commit any nuisance, or throw into, deposit, or leave coal, dirt, or stones, or other rubbish in the air courses or roads so as to interfere with, pollute, or hinder the air passing into or out of the mine.

Rule 43.—In all shafts or slopes where persons, coal, or material of any kind are hoisted or lowered by machinery the following code of signals shall be used:

One signal: To hoist coal or other material.

One signal: To stop cage or car when in motion.

Two signals: To lower cage or car.

Three signals: That persons are to be hoisted; on hearing which the engineer will signal back "ready" by giving one signal. On hearing the last-named signal the persons will get on car or cage, and when they are safely on car or cage one signal shall be given the engineer to hoist. After the hoisting of coal has ceased in the evening and the 5 o'clock whistle has blown, it will only be necessary to give the three signals for the first three cages of men hoisted, after which one signal "ready" will only be given for each cage until all the men are out.

Four signals: That mules are to be hoisted; on hearing which the engineer will signal "ready" by giving one signal. On hearing the last-named signal the mule will be placed on the cage, and when it is safely on the cage one signal shall be given the engineer to hoist.

Five signals: Turn steam on to slope or underground engines.

Six signals: Shut steam off from slope or underground engines.

Rule 44.—No person or persons shall go into any old or abandoned part of the mine or into any other place which is not in actual course of working without permission of the mine boss, nor shall they travel to or from their work except by the traveling ways provided and assigned for that purpose.

Rule 45.—No person in the mine shall be allowed to enter any room or working place except the working place to which his duties call him. It is strictly forbidden for any person to visit a room or other working place except his own, either during the presence or absence of its proper occupant. All boys or other persons assigned to special posts as trappers or otherwise must remain at their posts while on duty.

Rule 46.—All miners must be in the mine before the 7 o'clock whistle blows in the morning. Drivers must have their mules out of the stables and ready for work, and all other company men must be prepared to start work when the whistle blows at 7 o'clock.

Rule 47.—Any person found with tools or powder belonging to another or taking or using tools or powder belonging to another without the owner's consent shall, for the first offense, be fined \$2.50, and for the second offense he shall be discharged, such fines to be paid to the owner of the tools and collected at the company's office, and any person detected in exchanging checks on the pit cars shall be immediately discharged.

Rule 48.—Any miner or employee who shall damage any signal bell or wire, brattice, air way, or door, or open a door and not close it again, or do anything by which the safety of the men or mine may be endangered shall be promptly discharged.

Rule 49.—Whenever it shall be the duty of any person to go into the "sump," or space below the cage at the bottom of the shaft, for the purpose of cleaning out, removing dirt, or otherwise, they shall first place a prop or props of wood or iron in such a manner as to arrest the cage should it from any cause be made to descend, and thus secure themselves or others from possible danger.

Rule 50.—All employees who desire to absent themselves from work must notify the foreman under whom they work the day before. And any one absent without permission will for the first offense be suspended three days, and for the second offense be suspended one week, and for the third offense be discharged, except in case of sickness.

Rule 51.—All persons except those duly authorized are forbidden to meddle or tamper in any way with any electric or signal wire about the mine.

Rule 52.—No miner or other employee shall be entitled to receive his time at the company's office until he shall obtain from the mine boss a clearance card; and in case of employees renting a company house a note must be obtained from the superintendent's clerk stating amount of rent due.

Adopted July 24, 1897.

WILLIAM CAMERON, *Superintendent.*

Approved:

R. M. McDOWELL,
General Manager.

OSAGE COAL AND MINING COMPANY, KREBS, IND. T.

NOTICE.

The mines in this district generate explosive gas, commonly known as fire damp. The attention of all employees is especially called to the company's rules Nos. 1, 2, 3, 4, 6, 8, 44, 45, and all other rules, that all persons in the mines may be protected from this existing danger.

Windy or blown-out shots are liable to cause explosions, and in order to avoid and prevent this danger all shots must be carefully prepared in accordance with rules Nos. 10 and 19.

Miners are responsible for the safe and secure propping of the rooms in which they work, and each must see that his working place is carefully examined and made safe, in order to avoid accidents from falls of slate or coal.

Each employee must make himself thoroughly acquainted with all the rules of this company. He must strictly observe these rules and promptly report to the superintendent any infraction or disregard of the rules that comes to his notice.

Note and observe carefully all the rules and regulations in regard to powder, explosive gas, preparation of shots, and propping, and otherwise making working places safe.

July 24, 1897.

WILLIAM CAMERON, *Superintendent.*
R. M. McDOWELL, *General Manager.*

KANSAS AND TEXAS COAL COMPANY.

Officers.—B. F. Hobart, president, St. Louis, Mo.; W. P. Heath, secretary and treasurer; F. E. Doubleday, general superintendent; William Barrett, assistant superintendent, St. Louis, Mo.; Frank B. Smith, superintendent in Indian Territory.

SIMPSON MINE NO. 50.

This mine, as well as No. 52, is situated on the Missouri, Kansas and Texas Railway at the town of Cherryvale, the terminus of the McAlester branch.

This mine is a slope driven from the crop of the coal six lifts. It is equipped with a pair of double-gear hoisting engines, with 12 by 16 inch cylinders. Ventilation is had by two 10-foot fans. Abundant air is furnished to meet the requirements of the law. Escapement is had by means of one of these ventilating shafts, which is provided with a stairway, and additional escapement is also had by way of No. 52 mine, with which this mine is connected. There have been four accidents at this mine during the past year, none of which has been fatal.

SIMPSON MINE NO. 52.

This mine is about 3,000 feet from mine No. 50. The slope has been driven about 1,600 feet and has been connected with mine No. 50, which furnishes the necessary escapement. Ventilation is good and amply sufficient to meet the law's demands. This mine is equipped with a pair of double-gear hoisting engines, supplied with steam by two boilers. A Norwalk compressor has been erected, which supplies the Harrison compressed-air mining machines. It is the intention of this company to sink a shaft ahead of these slopes and drop

coal to the shaft by means of the slopes, which will give a large output, the work at present being carried on with that end in view. There have been two accidents at mine No. 52 during the past year, neither of which has proved fatal.

MINE NO. 2.

This mine is leased by the Kansas and Texas Coal Company from the McAlester Coal and Coke Company, and is a slope mine about 2 miles south of Cherryvale. It is equipped with an 18 by 24 inch single-hoisting engine with 60-horsepower tubular boiler, with two independent friction drums, one of the drums being used to pull coal out of the mine, the other being used to pull coal over the hill to the tippie, the tippie and railroad track being 1,300 feet distant from the slope. The mine is ventilated by an air shaft with stack and furnace.

There have been four accidents at this mine during the past year, one of which proved fatal.

This company has recently erected about one hundred houses for the use of their miners, with necessary store buildings, to which they have recently added a small ice manufacturing plant and cold storage, which add greatly to the comfort of the camp.

Attached hereto are letters from the Kansas and Texas Coal Company, with statistics of production, etc.:

ST. LOUIS, MO., *January 20, 1898.*

DEAR SIR: Complying with your circular letter of the 5th instant, below please find the information desired for your annual report:

	Production.	Number of men.
	<i>Tons.</i>	
Mine No. 50.....	33, 723	190
Mine No. 52.....	26, 313	182

Yours, truly,

W. P. HEATH, *Secretary.*

Mr. L. W. BRYAN,
United States Mine Inspector, South McAlester, Ind. T.

ST. LOUIS, MO., *July 16, 1898.*

DEAR SIR: Your favor of the 2d instant was received by me on the 6th, but on account of rush in closing books to the end of June I have not been able to get you the information asked for in that letter until to-day.

Output, average number of men employed, and days worked for six months ended June 30, 1898.

	Output.	Average number of men employed.	Days worked.
	<i>Tons.</i>		
Mine No. 2.....	18, 632	105	61.1
Mine No. 50 (two months only).....	7, 040	165	19.1
Mine No. 52.....	28, 056	157	69.8
Total.....	53, 748	427	.....

Yours, truly,

W. P. HEATH, *Secretary.*

Mr. L. W. BRYAN,
South McAlester, Ind. T.

Following are the rules adopted by the Kansas and Texas Coal Company:

RULES GOVERNING THE MINES OF THE KANSAS AND TEXAS COAL COMPANY IN THE INDIAN TERRITORY.

It is made the duty of the superintendent to see that each present employee of the company is furnished with a copy of these rules, and that a copy is handed to each new employee when engaged, and that the special attention of all employees is called to the fact that they are required to make themselves familiar with these rules and be governed accordingly.

Pit or mine boss.—It is his duty to make daily examination of all working places in the pit under his charge, or cause the same to be done by road men employed in such mine when he is unable to do so himself. He must see that all roads are kept clean and in good condition and doors for ventilation are kept in good order, so that a proper circulation of air will at all times be maintained in the mine; also make daily examination of all hoisting ropes, chains, and cages, and all attachments thereto, and if any defects are found to report same to superintendent at once and put in order and safe condition. He is to have charge of the mine underground, including top men and engineer, subject to the orders of the superintendent. It is his imperative duty to see that all these rules are enforced, and all employees in or about the mine are subject to his orders.

Engineers or hoisters are required to have their engine ready to move cages at 6 o'clock a. m. and all men and mules are expected to be in the mines before 7 o'clock. The hoisting and hauling must begin promptly on the sounding of the 7 o'clock whistle. They must at all times when on duty be where they can hear the signal gong to stop and start machinery and give it immediate attention. They are required to see that their machinery, boilers, and pipes are kept in proper condition, and their boilers cleaned out as often as once every two weeks, or at shorter intervals if found necessary, and at all times know that they have a sufficient amount of water in their boilers. Great care must be taken in cold weather to guard against the freezing of pipes. All pipes must be properly drained and protected.

Weighmen.—They are required to correctly weigh the coal mined. They will see that the top house is kept clean, and will make such reports for general office and local office as may be required of them.

Yard man.—He is required to have empty cars always ready to run under the chute without delay to take the place of loaded cars. He must examine all brakes and see that they are in working condition, and that all doors of box or stock cars are closed and properly fastened before being allowed to leave the mine, and to see that all cars are loaded as nearly as possible to capacity weight, and that all cars set under chute to be loaded are in proper condition to receive coal. When coal cars are found damaged by holes in floors or sides boards must be securely nailed over such places to prevent loss of coal in transit. He will be subject to weighman's orders.

Road men are required to keep all roads and entries in proper and safe condition, take down any loose rock found, and make such places absolutely safe by timbering, and under no circumstances to permit any men or mules to be allowed to go into any entry or working place considered unsafe. They are required to examine carefully all main and cross entries and see that they are in safe condition. They will also examine carefully all track in main and cross entries and see that the same is kept in good repair. They will be at all times subject to the orders of the pit boss.

Top men or dumpers and gripman on top.—The duty of the gripman on top is to couple the empty cars (after being dumped) on to the rope and send same down the slope into the mine. He must exercise great care in attaching the grip to the rope and know that it is properly adjusted to the rope and firmly gripped to it before permitting the car to leave the top. Top men must receive the coal at the top landing and dump the same without delay. They will assist the weighman in keeping the top house clean and be subject to his orders.

Drivers.—They are required to have their mules properly cleaned and harnessed ready for work on blowing of the whistle at 7 a. m. Any driver who does not give his mule proper attention and good treatment, or who is known to abuse, mistreat, or injure his mules in any way shall be discharged. It is the imperative duty of drivers to bring in props and timbers promptly whenever requested to do so by any miners working in rooms, entries, or on pillars from which coal is being handled. Any violation of this rule shall subject the driver to immediate dismissal. Drivers shall pull the empty cars to the face of the pitch rooms. They are also required to report all unsafe and dangerous places in the mine they find, as well as any unsafe track, and are forbidden to go into or drive over any track or through any place they consider unsafe.

Shot firers.—Miners are strictly forbidden to fire shots; shot firers shall be employed for this purpose. Unless otherwise designated, the time for firing shots shall be 12 o'clock noon when half time is being worked, and 5 o'clock evening when mine is working three-fourths or full time. Any miners or employee detected in breaking this rule shall have his turn stopped and shall be suspended for one week for the first offense and for the second offense shall be discharged.

Shot firers must not fire any shots unless coal is cut as specified in instructions to miners in these rules and the shot is otherwise considered proper and safe. Only one shot shall be fired at a time in any separate split of air, and the following shot not to be lit until the smoke is cleared away. No shot shall be fired while anyone except the shot firer is in the mine, and he shall not enter the mine for the purpose of firing until all the men are out of the mine.

Gripman in mine.—His duty is to couple the car of coal to the hoisting rope at each entry or lift, to send same to the top for dumping. He must exercise the greatest care in attaching the grip to the rope and know that it is properly adjusted and firmly attached to the hoisting rope before permitting it to start the loaded car up the slope, and give signals for stopping and starting the rope haulage in slope.

Miners.—All miners must be in the mines before the whistle blows at 7 a. m. All coal must be undercut 2 feet in rooms, or sheared on the rib, or cut in center to a depth of 4 feet the full thickness of the seam or vein of coal, and no shot be placed so that the point of the shot or any part of the powder shall be more than 4 feet from the face or more than 2 feet beyond the undercutting. All entries or narrow work under 12 feet wide to be undercut, sheared, or out the full depth of holes drilled for blasting.

It shall be the duty of every miner to keep his room or working place well propped, in good order and repair, and perfectly safe in every way. He is hereby forbidden to continue at work in any place found unsafe until the same is made safe. Any miner who shall willfully and negligently or carelessly suffer his room to get out of order and repair shall, upon request, put same immediately in repair, and in event of his failure to do so when ordered the company will do the work required and charge the cost of same to the miner.

Care must be taken in loading mine cars to prevent loss to both miners and the company by coal falling off and causing wreck on slope.

Miners must remove all slate from their coal while loading it into their cars. Any miner sending out slate in his coal cars shall, for the first offense, be docked, for the second be suspended for one week, for the third be discharged. Miners must run their loaded cars down their rooms to the parting, but not out on the entry.

Miners driving entries must have roadway brushed 5 feet from rail; ties shall be 2½ feet apart in roadway, and sunk on upper side before roadway is measured.

GENERAL RULES.

It is the duty of every man working in the mine who discovers any place that is unsafe to at once notify the pit boss or road man, that the same may be put in proper condition. It is earnestly desired that all employees will pay strict attention to this requirement, as it is the effort of this company to have the safety of the men considered before anything else.

Any miner or employee who shall intentionally damage any signal bell or wire, safety lamp, brattice, airway or door, or open a door and not close it again, or do anything by which the safety of the men may be endangered shall be promptly discharged.

All persons employed in the mines are strictly forbidden to ride up and down the slopes, and all men that may require to leave the mine while hoisting is being done must travel out the manways.

All employees who desire to absent themselves from work must notify the foreman under whom they work the day before. Any one absent without permission will, for the first offense, be suspended three days, and for the second offense be suspended one week, and for the third offense be discharged. All miners absenting themselves three consecutive days without permission will be considered as having left the employ of the company, and their places will be assigned to others.

No miner who has left the employ of the company or who has been discharged from the same shall be entitled to any pay or money due him until he shall have put his room in working order, as required by the company. All miners leaving said employment will be required to secure the certificate of the pit boss that they have complied with this rule before final payment or settlement shall be made.

Any tenant of the company will be charged for any damage done to the house he occupied; and upon leaving its service, whether voluntarily or by discharge, will not be entitled to receive any part of the wages due him until he shall have vacated the premises occupied by him and presented the keys of the same at the office and the house has been examined and the amount of damages, if any, deducted from his wages.

No person will be allowed to interfere with the employer's just right of employing, retaining, or discharging any person or persons whom the superintendent or mine boss having charge of the mine may consider proper, or to interfere in any way, by threats or otherwise, with the right of any employee to work in any way and upon any terms and with whom he may think proper and best, under penalty of being discharged.

Anyone detected violating any of the above rules for which no penalty is named will for the first offense be suspended three days, for the second offense will be suspended one week, and for the third offense will be discharged.

Entering the employment of the company is understood to be an acceptance of the foregoing rules.

B. F. HOBART, *President.*

MCALISTER COAL AND COKE COMPANY.

This company operated a mine which is now described under the head of the Kansas and Texas Coal Company Mine No. 2. This mine has been leased by the McAlester Coal and Coke Company to the Kansas and Texas Coal Company.

There were no accidents at this mine during the past year, while under the management of the McAlester Coal and Coke Company.

Appended hereto is a letter giving the output of this mine.

KREBS, IND. T., *December 30, 1897.*

DEAR SIR: We beg to report the output of our Mine No. 2 for the six months ended December, 1897, as follows:

	Lump.	Egg.	Mine run.	Nut.	Slack.	Men.	Days worked.
	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>		
July.....	880	71	102	28	558	53	4
August.....	3,788	129	97	97	2,352	112	23
September.....	8,923	176	539	831	2,610	120	23
October.....	3,811	104	240	271	2,364	114	18½
November.....	3,112	523	144	307	1,887	105	17½
December.....	667	454	98	75	961	89	7

On the 11th of December we leased our mine to the Kansas and Texas Coal Company, hence we only can report output up to and including the 11th instant, the Kansas and Texas Coal Company handling all the output from that time on.

Yours, truly,

MCALISTER COAL AND COKE COMPANY,
CHAS. INNES, *Cashier.*

Hon. L. W. BRYAN,
United States Mine Inspector, South McAlester, Ind. T.

MILBY & DOW COAL COMPANY.

Officers.—Andrew Dow, president and general manager; C. H. Milby, secretary and treasurer.

This company operates a slope mine on Brushy Creek, between Harts-horne and Alderson, and is operated under the laws of the State of Texas. The subjoined letter from Mr. Ludlow gives briefly the progress made by this company during the past year. Coal is about 3 feet thick, with a 6-degree pitch to the west. This coal is a part of the well-known McAlester vein. Output for the past year, 19,800 tons. There has been one accident at this mine during the past year, caused by a miner returning to his work before the powder smoke had cleared away, and which proved fatal.

HARTSHORNE, IND. T., *July 16, 1898.*

DEAR SIR: The tonnage from the Milby & Dow Coal and Mining Company's mine for the six months ended June 30, 1898, amounts to 9,371.11 tons.

The Milby & Dow Coal and Mining Company have been operating a slope during the last year at their mine located about 3 miles west of Hartsborne, on the McAlester or Alderson vein. They have now completed a shaft 214 feet to the coal, at a distance of 1,500 feet from the outcrop, and expect to have their slope and shaft connected early in October. They have erected a tippie, with self-dumping cages, and a pair of 18 by 32 Litchfield engines, and by the 1st of August they expect to be in shape to commence quite heavy shipments.

Yours, truly,

EDWIN LUDLOW,
Consulting Engineer.

L. W. BRYAN, Esq.,
United States Mine Inspector, South McAlester, Ind. T.

P. S.—Milby & Dow Coal and Mining Company, slope 9, March 27 to December 31, 1897: Output, 10,429.17 tons.

CAVANAL COAL AND MINING COMPANY.

Very slight changes have taken place in the workings of this mine during the past year. The mine is located on Cavanal Mountain, about 3½ miles east of Poteau, on the St. Louis and San Francisco Railway. The company owns a branch track from the foregoing railroad to the mine. During the past six months of the year just ending very little has been done. An electric plant was put in and eight mining machines put in operation, and ventilating fans were connected with the dynamos. Owing, however, to financial difficulties, the electric machines were taken away by the company furnishing them. The property of this company was recently attached by creditors, which caused a stoppage of the production. Reorganization is now taking place, and it is expected that the mine will soon be in successful operation. There were no accidents at this mine during the past year.

KIOWA COAL COMPANY.

Officers.—H. L. S. Kniffin, president and treasurer; W. A. Harford, secretary and auditor; J. P. Watkins, vice-president and secretary.

This company has been operating the mines at Savanna and Fairview which have been previously reported under the head of Savanna Coal Mining and Trading Company, the Kiowa Coal and Mercantile Company, the Choctaw Coal and Mercantile Company, the Tebo Coal and Mercantile Company, and the A. Peckanpaugh Mine. Owing to the very steep pitch of the coal in these mines the production of coal is attended with great difficulty. I have notified this company that a manway must be completed speedily at Fairview.

The following letters will give a résumé of the progress of this company during the past year:

SAVANNA, IND. T., July 28, 1898.

DEAR SIR: Replying to your inquiry of recent date regarding the several mines operated by this company, beg to state that we are operating but three out of the five slopes with which we began operations here last December. Owing to the close proximity of two slopes sunk close to the two main ones they have been abandoned for hoisting purposes and have been converted into manways, by which men enter the mine and come out while coal is being hoisted.

Both of these slopes are being worked on the first lift and coal is being taken from both sides of the slope. The one is 212 feet deep, and the other 240 feet to the first lift; all are well ventilated, have no gas, and are in good condition. The one makes some water, just enough to keep down the dust, and the other we bail out once a week. Coal is being pushed to the slope by men in the one mine, and are working mules in the other one, the entry of which is driven 1,000 feet west of the slope. The roof is good and firm.

Mine No. 5, or better known as "Fairview," is in a good condition. The slope is double, and coal is being hoisted by two cages; it is 325 feet to the second lift, which is the only lift being worked. The entries are driven with air course and are a distance of 800 feet each way from the slope, and entries are in a good and safe condition, well ventilated and makes little water.

No accidents worth reporting have occurred during the period this company operated these mines.

Respectfully,

W. L. SMITH, *Superintendent.*

L. W. BRYAN, Esq.,

United States mine inspector, South McAlester, Ind. T.

Statement of output.

1898.	Lump.	Mine run.	Nut.	Nut and slack.
	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>
January	890.35	.....	100	820.45
February	1,575.7	.....	238.15	349.7
March	1,519.4	.....	214.6	497.5
April	1,627.45	26.55	390	743.15
May	1,029.3	261.8	270	464
June	1,167.4	713.95	60	79.35
	7,779.4	1,002.3	1,272.75	2,954.15

Average number of employees, 96.

McALESTER COAL AND MINERAL COMPANY.

Officers.—James Deguan, president; James McConnell, general manager.

This mine is located in the town of Wilburton. The coal is in two veins, separated by a strata of 50 feet, the lower vein being about 5 feet thick with a dip of 18 degrees, the upper vein being the same dip and about 4 feet 6 inches thick. The lower vein is sunk down by a slope two lifts or about 500 feet, the upper lifts being pretty well worked out. In the upper vein a slope is sunk about 800 feet or three lifts, entries being turned off the slope. Air courses are driven in the lower vein on each side of the slope, and parallel thereto, with all proper connections and break throughs. In the upper vein a single air course runs parallel to the slope with proper connection. There are four air shafts, or two to each vein, and ventilation is had by furnace, and proper escapements are in use and being driven. Hoisting is done from the lower vein by means of 14 by 20 single engine, built by Fulton Iron-works Company. For the upper vein a small portable engine is used. Steam is furnished by two boilers. A switch with proper storage tracks is built to the main line of the Choctaw, Oklahoma and Gulf Railway. Output for the past year was 16,170 tons. There was no accident during the year.

SAMPLE'S MINE.

This mine, which is located near McAlester, Ind. T., has been considerably extended during the past year. The plane has been driven up hill a considerable distance, rooms being turned off at right angles. A dummy car is used for conveying coal by gravity, the loaded cars pulling up the empty ones. The output of coal for the past year was 6,000 tons, which product was hauled to the Missouri, Kansas and Texas Railway at McAlester. Coal is about 4 feet thick. Ventilation by air shaft and furnaces. Equipment is single Ledgerwood engine and boiler. No accidents during the past year.

OLA COAL AND MINING COMPANY.

O. E. Woods, general manager.

This concern, which was known and reported as Wilburton Coal Company in my last report, is located about 2 miles east of Wilburton, at a spur known as Ola Spur. There are two veins of coal at this point separated by about 50 feet of strata—the upper vein being about 4 feet 6 inches thick, with a dip of about 28 degrees, the lower vein being the same dip and about 5 feet thick.

At about 900 feet south from the main line of the Choctaw, Oklahoma and Gulf Railway a slope called Mine No. 1 has been sunk in the lower vein about 400 feet, and a slope has just been commenced in the upper vein directly over the first-named slope in the lower vein. From the face of the slope in the lower vein entries have been turned, one to the east about 1,200 feet in length, and one to the west about 600 feet in length; the first-named entry intersecting at right angles another slope hereafter described, thus providing escapement for the slope first named. Air courses have been driven on each side of slope in Mine No. 1, with proper break throughs, and ventilation is had by a 12-foot fan driven by an 8 by 12 Erie City engine, which is located at the mouth of an air shaft, which shaft is immediately over the east air course parallel with the slope. Hoisting is done from the lower vein of Mine No. 1 by means of a 50-horsepower engine, geared to a 6-foot drum, and furnished with steam by a pair of boilers, the same boilers supplying steam to a pair of upright, double engines for hoisting coal from the upper vein.

Slope Mine No. 2 is being driven by the above company in the lower vein, some 1,400 feet east of Mine No. 1. This slope is down about 250 feet. One air course is driven parallel with slope, with proper connections and breakthroughs. Rooms are turned off of the slope, and this slope intersects the east entry of Mine No. 1, heretofore described, thus furnishing escapement for each mine. Ventilation at present is had by means of a furnace and air shaft. Hoisting is done by a Lidgerwood single engine, 7 by 10, with upright boiler. A track has been laid from the main line of the Choctaw, Oklahoma and Gulf Railway, passing No. 1 Mine, at which point a small tippie has been erected. About a mile farther east another opening has been made, sufficient to show the character of the coal. Output of these mines was about 8,740 tons for the past year. Two accidents have occurred, neither of which proved fatal.

WILBURTON COAL AND MINING COMPANY.

Officers.—William Busby, president; James Elliott, secretary and treasurer; M. J. Smith, superintendent.

This concern is located on the Choctaw, Oklahoma and Gulf Railway, 1 mile east of Wilburton. The coal at this point is in two veins, separated by about 50 feet of strata, the upper vein about 4½ feet thick with a dip of about 25 degrees, the lower vein about 5 feet thick with a dip same as the upper one. At about a mile east of the town of Wilburton two slopes have been sunk, the one directly over the other. The slope in the upper vein has been sunk about 240 feet and the lower one about 260 feet. No entries have yet been turned. Air courses are driven in each vein parallel with the slope, one air course on each side, proper breakthroughs and connections being made. Escapements are being driven for each slope, the mouth of which when finished will be not

less than 200 feet from the mouth of each slope. Ventilation will be had by the use of fans in ventilating shafts, one for each opening as above, but at present air for sinking purposes is furnished by furnaces and stacks. One double Lidgerwood hoisting engine, 8 by 10, operates both of the above slopes, the pit cars alternating in the two slopes mentioned, the coal being dumped over a permanent tippie which has been erected to accommodate both of the openings, which are known as Nos. 1 and 2. A track is built from the main line of the Choctaw, Oklahoma and Gulf Railway 3,200 feet in length, with necessary storage tracks to accommodate the output. Railroad scales have been put in and houses built, and other necessary improvements have been made.

Another opening, known as Mine No. 3, has been made in the lower vein about three fourths of a mile west of Nos. 1 and 2 slopes, close to the railroad depot at Wilburton. This slope has been driven down 210 feet, air shaft sunk, and stack built for ventilating purposes. A pair of double Lidgerwood engines, 8 by 10, with appropriate boiler, is used for hoisting purposes, the coal being hauled by wagons to the main line of the Choctaw, Oklahoma and Gulf Railway. Everything necessary to comply with the United States law will be provided as the work proceeds. There have been no accidents at any of the above mines during the past year.

PERRY BROTHERS, COALGATE, IND. T.

This mine has been operated to a very slight extent during the past year, and is in about the same condition as last reported. Output for the past year, 2,631 tons. No accidents.

D. EDWARDS & SON, MCALESTER, IND. T.

This firm operates two slopes, about one-fourth of a mile apart, driven into a 4-foot vein of coal with a dip of 30 degrees to the southeast. There are two lifts to Slope No. 1. Escapement is had by entry driven from Slope No. 1 to Slope No. 2. Hoisting is done by a pair of small double engines furnished with steam by an upright boiler. Ventilation is had by furnace. During the past year the slopes have been driven down some distance and escapement driven. Coal is 4 feet thick and is on the McAlester vein. Output for the year, 2,333 tons. One accident to report, which proved fatal.

FOLSOM COAL COMPANY.

This concern, which is owned by J. B. McDougal, Coalgate, Ind. T., has been operated very little. Output, 1,452 tons. No accidents.

WESTERN COAL AND MINING COMPANY.

This company has done a small amount of stripping at Bull Creek, near Inola, Ind. T. Output for the year, 1,425 tons. No accidents.

SAVANNA COAL, MINING AND TRADING COMPANY.

This company only operated to a small extent during the first six months of the past year. The plant of this company is now operated by the Kiowa Coal Company, under which head the output of the last six months is included. Output, 969 tons. No accidents.

HAILEY MINING COMPANY.

D. M. Hailey, owner.

Mr. Hailey is having a slope driven three lifts by contract with Halstead & Corley, and is preparing for a considerable output this fall and winter. Mr. James Elliott, of Krebs, will be general manager of this work. The mine is located on the Choctaw, Oklahoma and Gulf Railway, about $1\frac{1}{2}$ miles west of Hartshorne, Ind. T. Coal is 4 feet thick, is on the Hartshorne vein, and is about the same pitch as the Krebs and Alderson coal. This mine will be well equipped and is expected to produce considerable coal. No output to date and no accidents to report.

COKE PLANTS.

The Osage Coal and Mining Company have had 80 ovens in operation during the past year, the production being 18,490.40 tons, all of which was 72-hour washed coke.

The Choctaw Coke Company, Alderson, have 50 ovens in operation, as well as a coal washer. Employment is given to 34 men, and the output for the past year was 16,320 tons.

Statement showing output of coal and average number of men employed for the years ended June 30, 1894, 1895, 1896, 1897, and 1898.

Names of companies.	1894.		1895.		1896.		1897.		1898.	
	Tons.	Men.	Tons.	Men.	Tons.	Men.	Tons.	Men.	Tons.	Men.
Choctaw, Oklahoma and Gulf Rwy. Co.	333,616	932	397,186	1,011	366,009	951	347,123	750	460,161	913
Southwestern Coal and Improvement Co.	261,596	847	322,872	800	300,238	738	383,712	738	352,618	614
Atoka Coal and Mining Co.	133,480	435	166,963	416	175,068	539	163,272	476	193,201	485
Osage Coal and Mining Co.	220,523	896	237,604	800	213,888	660	206,268	737	163,028	612
Kansas and Texas Coal Co.			16,800	100	70,510	326	97,232	240	143,778	324
McAlester Coal and Coke Co.					38,757	116	52,931	119	30,609	99
Milby & Dow Coal Co.									19,800	40
Cavanal Coal, Coke and Rwy. Co.			7,989	54	10,000	75	23,366	85	19,605	80
Kiowa Coal Co.					300	30	2,079	18	19,008	96
McAlester Coal and Mineral Co.			300	10	3,000	15	3,500	25	16,170	45
Noah Samples			12,000	80			1,000	12	6,000	25
Ola Coal Co.							300	10	8,740	32
Wilburton Coal and Mining Co.									5,575	34
Perry Bros.			500	10	5,400	21	4,956	20	2,631	10
D. Edwards & Son.			3,755	54	3,254	21	4,100	14	2,333	10
Folsom Coal Co.					19,585	60	7,077	24	1,452	10
Western Coal and Mining Co.			20,600	90			16,232	45	1,425	15
Savanna Coal, Mining and Trading Co. ^a			22,506	48	12,530	40	10,219	25	969	10
Sundry strip pits, Creek Nation.			7,800	60	7,000	55	6,500	42	6,000	35
Hailey Mining Co.										
Tebo Coal and Mining Co. ^b ..	3,600	45								
Choctaw Coal and Mining Co. ^b ..	2,500	10			6,000	30	1,000	10		
Jenson Coal Co. ^c ..					3,800	18	5,500	35		
A. Peokanpangh.							500	5		
Harkins & Co. ^c ..			7,000	39						
Sundry small openings and strip pits (west of Vinita) ..	5,000	100	4,275	76			7,400	40	5,000	40
Total	966,315	3,265	1,228,440	3,648	1,235,333	3,095	1,343,376	3,470	1,458,098	3,529

^a Now operated by the Kansas and Texas Coal Co.

^b Now operated by the Kiowa Coal Co.

^c Abandoned.

STATEMENT OF ACCIDENTS AT THE INDIAN TERRITORY MINES FOR
THE YEAR ENDED JUNE 30, 1898.

On July 8, 1897, at Coalgate Mine No. 4, operated by the Southwestern Coal and Improvement Company, R. D. Cooper, an American miner, was caught by a trip of cars coming down the slope as he was walking up the slope. It was not supposed at the time that his injuries were serious, but they proved to be so and he died on the second day after being hurt.

On July 19, at Coalgate Mine No. 4, operated by the Southwestern Coal and Improvement Company, Peter Williams, an Italian miner, was injured by a fall of coal which fell on him while he was mining off a shot, injuring him, but not seriously, about the lower part of the body and hips.

On July 28, at Gowen Mine No. 2, operated by the Choctaw, Oklahoma and Gulf Railway Company, two men, Joe Condron and Jule Glory, were seriously burned, one of them, Joe Condron, fatally. These men went into room No. 4, in above-named mine and disregarded the danger marks that had been put at the entrance to their working place by the fire boss, and in violation of this rule walked over the mark into the gas with naked lamps, which ignited the gas and caused their injuries.

On August 4, at Hartshorne Mine No. 1, operated by the Choctaw, Oklahoma, and Gulf Railway Company, Tony Ross, an Italian miner, was instantly killed, and his son, Nicholas Ross, seriously injured, by a fall of slate from the roof, in room No. 47, main north entry. Tony Ross was aware of the loose piece of rock, and had sent his boy to borrow a sledge to prop it, and the boy had just returned when the slate fell, injuring these parties as described.

On August 20, at Coalgate Mine No. 5, operated by the Southwestern Coal and Improvement Company, J. O. McNeil, an American miner, attempted to get on the cage while in motion, and was caught and crushed to death. The cause of this accident was the man's own rashness in attempting to get on the cage while in motion.

On August 23, at Simpson Mine No. 50, operated by the Kansas and Texas Coal Company, James Meyer, a Scotch miner, was slightly burned by fire damp. This man was driving an air course ahead of any break throughs, and having left his work for a short time, returned with his naked lamp without brushing out the gas as he should have done, and was consequently injured.

On August 26, at Wilburton Mine No. 1, operated by the Wilburton Coal and Mining Company, William Phalen, a German miner, was burned by fire damp. During the opening up of new mines, as this one was, especial care is necessary, but this man carelessly went into a tight place in a break through, where a small amount of gas had accumulated. His injuries were not of a very serious character, however.

On September 23, at Simpson Mine No. 50, operated by the Kansas and Texas Coal Company, James Heathcote, an English miner, was slightly burned by fire damp which had accumulated in a pot hole in the roof. His injuries were of slight character.

On September 20, at Gowen Mine No. 2, operated by the Choctaw, Oklahoma and Gulf Railway Company, John Gasper, Italian coal miner, and J. H. Wilson, American coal miner, were burned by a shot blowing through into a room adjoining the one in which they were working. These men had fired a shot into the break through, which had nearly been driven through into the adjoining room, and had gone

into the adjoining room for safety, but had carelessly placed themselves in a very dangerous position, as they had ample opportunity of knowing that the shot was liable to blow through. They were burned somewhat seriously, but both recovered.

On September 23, in Alderson Mine No. 7, operated by the Choctaw, Oklahoma and Gulf Railway Company, Philip Gillespie, an American driver, was squeezed by being caught between a trip of cars, which he was driving, the mule backing on him.

On September 27, at Alderson Mine No. 1, operated by the Choctaw, Oklahoma and Gulf Railway Company, three men were burned in room No. 61, on the sixth east entry. Their names were Walter Kendal, colored miner, Daug White, colored miner, and John Rocker, colored miner. The fire boss had examined this room in the morning, and had marked it, indicating a small amount of gas. It is presumed that these men had attempted to brush out the gas, and in the attempt had ignited the gas by one of their lamps. White was injured fatally and died on the 29th of September. The other two have recovered. This mine, being a very large one, the air has a long distance to travel, the point at which this accident occurred being about 3,000 feet from the mouth of the mine.

On 28th day of September, at Coalgate Mine No. 5, operated by the Southwestern Coal and Improvement Company, George Gay, an English shot firer, was found dead in room No. 45 on the straight north entry. The presumption is that this man was trying to fire two shots at one time, which is in violation of the rules, and probably miscalculated the time necessary for the shots to explode, and was caught and killed.

On October 8, at Lehigh Mine No. 5, John Santer, a German miner, while undermining a loose piece of coal, had his leg broken by a piece of coal falling on him before he could get out of the way.

On October 11, at Simpson Mine No. 50, operated by the Kansas and Texas Coal Company, William Lewis, a Polish miner, was slightly burned by igniting a small amount of gas which had accumulated in his working place.

On October 13, at Alderson Mine No. 7, operated by the Choctaw, Oklahoma and Gulf Railway Company, William Jackson, colored miner, was killed by the explosion of a shot which he had placed for the purpose of brushing. It seems evident that he had placed this shot in such position that when passing it with his lamp on his cap it became ignited and shot down upon him, killing him instantly.

On October 18, at Gowen Mine No. 2, operated by the Choctaw, Oklahoma and Gulf Railway Company, two men were burned by fire damp. Their names were Foster P. Hallbert, Indian miner, and John Lewis, miner. These men went into a room which was not being worked and ignited the gas. In going into this room they acted in violation of the strict rules of the company, and their injuries, which were not fatal, were the result of their own carelessness.

On October 18, at Lehigh Mine No. 5, operated by the Atoka Coal and Mining Company, Henry Kraft was slightly injured by fall of coal.

On October 19, at Edwards & Son's mine, McAlester, Ind. T., Gion Perardia, an Italian miner, lost his life by returning to a shot. He had waited some time—during which time the shot had hung fire—and becoming impatient went back to it, when it exploded and his neck was broken by a piece of coal striking him or by the force of the shot driving him against the side of the room.

On November 8, at Lehigh, Ind. T., No. 5, operated by the Atoka Coal and Mining Company, James Forsythe, a Scotch miner, had his

leg broken by fall of coal. This man was mining off a shot, when a piece of coal weighing about 400 pounds fell, catching his leg near the foot.

On November 24, at Hartshorne Mine No. 1, operated by the Choctaw, Oklahoma and Gulf Railway Company, John Varatti, an Italian boy miner of about 15 years old, had his leg broken by fall from the roof. This boy was assisting his father and was on his way out to see the driver to order necessary props, and while standing in the entry a piece of slate fell, striking him on the leg.

On December 2, at Mine No. 9, operated by contract by John M. Grady, and owned by Milby & Dow Mining Company, W. W. Boardman, an American miner, returned prematurely and in violation of the rules to his room where shots has been fired at noon, and before the smoke had cleared away. He became suffocated by the powder smoke and was found dead.

On December 4, at Coalgate Mine No. 4, operated by the Southwestern Coal and Improvement Company, James Reilly, an American timberman, lost his life by attempting to get on a trip of cars that was on its way up the slope. This man had, prior to being a timberman, been a rope rider on this same slope, and was used to riding up and down on the trips and getting off and on while they were moving at a high rate of speed. In this case, as it was quitting time, he and two other men were on their way out and were walking up the slope when the trip passed them. He attempted to get on the trip, missed his footing, was caught by the cars, and injured so that he died in two hours.

On December 11, in the morning, a fire occurred at Hartshorne Shaft No. 1, operated by the Choctaw, Oklahoma and Gulf Railway Company, in the seventh north entry off slope, caused by a shot that had been fired by the night shift, which shot set fire to the gas, then to the brattice and the coal. This fire was discovered by the fire boss as he was going his rounds. The alarm was given at once, the place deadlined, and no one allowed to enter the shaft except those needed to get the fire under control. Almost all the men came to the shaft by or before 7 o'clock to go down. The entries at the foot of the shaft were also marked with deadlines, beyond which no one was expected to go. About 1,800 feet distant is No. 2 slope, which has at its mouth the fan and which is also the escapement. Five men went down, and not heeding the danger marks went into their working places, which were a long distance from the fire and about 1,200 feet from slope No. 6, up which the air would pass from the place where the fire was on its way to the fan. Three of these men did what work they wanted to do, came out, and went home—two of them at 9 o'clock, the third at 11 a. m.—leaving Luka David and John Gurko, both Austrians, in the mine. These men had been told by the others that they had better go out, but said they would remain and put in another shot. About 6 p. m. the men who had come out during the morning went to the fire boss and told him that these two men were still in the mine on the north side. He went at once with other men and found them on the No. 6 slope dead; but there was so much smoke that he could do nothing with them. Returning, he got five men and returned to the place where David and Gurko had been working. They found the bodies of the men about 40 feet apart on the main No. 6 slope, with their dinner buckets on their arms. Had these men, David and Gurko, not gotten in the entry where the fumes and smoke from the fire had to pass they would no doubt have gotten out all right as there was no smoke or sulphur in their working places, and the men who were working on the same entry said that they detected no smoke while they were in, except that from shots which these same men had fired. These men lost their lives by violating one of the principal rules

of the company and by disregarding the danger marks, with which they could not help but be familiar; and they certainly must have known that something was wrong as no coal was being hoisted and no drivers in to supply them with cars. The fire was soon controlled and put out and the mine in full operation on the following Tuesday.

On the morning of December 12, at Gowen Mine No. 2, operated by the Choctaw, Oklahoma and Gulf Railway Company, a fire was discovered near the foot of the shaft by the man who attended to the mules that are kept in an underground stable. He went down the shaft for the purpose of feeding them Sunday morning and found a big fire raging, so that he could not get near the stable. He gave the alarm, the fire was gotten under control and entirely out by Monday afternoon, but the mules were all dead and fearfully cooked. There were eighteen of these mules in the mine. New mules were put in, the damages caused by the fire repaired, and the mine in operation on the 16th.

December 13, at Lehigh Mine No. 6, operated by the Atoka Coal and Mining Company, William Brecken, an English timberman, was slightly injured by a fall from the roof in the straight south entry, while timbering the same.

On December 14, at Alderson Mine No. 7, operated by the Choctaw, Oklahoma and Gulf Railway Company, Martin Verbal, a Polish miner, was injured by a fall from the roof while running the mining machine. He was not seriously injured.

On December 20, at Gowen Mine No. 2, operated by the Choctaw, Oklahoma and Gulf Railway Company, Harrison Walker, a colored fireman, was killed by the explosion of a boiler that he was firing. It seems that the water had been allowed to get low in the flues, which caused one of them to collapse. The fireman had stepped over to the engine house to inform the engineer that something was wrong with one of the boilers, and on his return as he was entering the door the boiler exploded, causing his death.

On December 31, at Simpson Mine No. 50, operated by the Kansas and Texas Coal Company, Ned Douthwaite, an English miner, was slightly burned by gas. This man was opening a new room, and while at work in it struck a gas feeder and carelessly lighted it with his lamp, burning him slightly about the face.

On January 19, 1898, at Alderson Mine No. 7, operated by the Choctaw, Oklahoma and Gulf Railway Company, James Dukes, a colored driver, was injured by flying coal from a trip of runaway cars. His injuries were very slight.

On January 24, at Simpson Mine No. 52, operated by the Kansas and Texas Coal Company, Robert Barker, an English miner, was slightly injured by fall of rock from the roof.

On February 2, at Simpson Mine No. 52, operated by the Kansas and Texas Coal Company, George Drumwright, an American miner, was injured by attempting to ride out on loaded trip of cars, in violation of the rules. He was caught between the top of the cars and the roof, but was not seriously injured.

On February 4, at Alderson Mine No. 7, operated by the Choctaw, Oklahoma and Gulf Railway Company, John McEwen, a shot firer, was injured by going back on a shot. He had lighted three shots, and it appears that one of them hung fire for some time, when, becoming impatient, he went back to see why the shot had not gone off, and it exploded, injuring him about the face.

On February 12, at Gowen Mine No. 2, operated by the Choctaw, Oklahoma and Gulf Railway Company, Marion Beatress, an Arabian miner, was fatally burned by going in a room with his naked lamp,

after being warned that the room was dangerous and that he was not to go in. It seems that a mule which he had been handling had gotten away from him and ran up into this old room. In going after it he passed thoughtlessly into the room with his naked lamp on his cap, thus igniting the gas; he was burned so severely that he died as above stated.

On February 21, at Alderson Mine No. 7, operated by the Choctaw, Oklahoma and Gulf Railway Company, George Crowder an English shot firer, and Joe Stephenson, an English shot firer, were instantly killed by an explosion from a windy shot. These men were employed in this mine as shot firers on account of the mine generating fire damp and producing explosive coal dust, and it was a part of their duty to carefully examine all shots before firing them to see that they were properly placed and would not result in windy or blown-out shots. It is the duty of shot firers, if shots are improperly placed, not to fire them, but to report them to the mine boss. It would seem that these two men suspected some danger from this shot, as they had only ignited one shot in the room. The shot when fired proved to be a windy shot and caused a terrific explosion. This would have resulted in wholesale death had there been other men in the mine at the time of the explosion. Two men who were at work on the main slope were slightly injured. The shot that caused this explosion was improperly placed and ought not to have been fired.

On February 25, at Mine No. 2, operated by the Kansas and Texas Coal Company, John Robus, a Polish miner, had his leg broken by a fall of slate from the roof. This fall came suddenly and without warning, and appears to have been purely accidental.

On March 16, at Mine No. 2, operated by the Kansas and Texas Coal Company, John Plumb, an English miner, was instantly killed by a fall of about 400 pounds of coal, which fell on him while he was on his knees mining off a shot.

On May 2, at Mine No. 5, operated by the Osage Coal and Mining Company, Peter Massard, an Italian miner, was injured by the fall of a piece of coal, which dislocated his ankle.

On May 11, at Mine No. 2, operated by the Kansas and Texas Coal Company, John Ruschell, a German miner, was slightly burned by fire damp, in entry No. G, where a small amount of gas had accumulated.

On May 16, at Alderson Mine No. 1, operated by the Choctaw, Oklahoma and Gulf Railway Company, Hardy Howard, an American miner, was acting as a driver while the regular driver was away. The tal chain became unhooked and he lost his balance and fell under the cars, dislocating his leg and kneecap and breaking two of his ribs.

On June 3, at Alderson Mine No. 1, operated by the Choctaw, Oklahoma and Gulf Railway Company, William Percy, a Scotch miner, was slightly injured by a small piece of draw slate falling out of the roof without warning.

On June 3, at Wilburton Mine No. 1, operated by the Ola Coal and Mining Company, John Carpo, a Slavonic miner, had his leg broken by the giving away of props which he had placed to hold pit car on the slope, and which let the car back on him, injuring him as described.

On June 2, at Lehigh Mine No. 6, operated by the Atoka Coal and Mining Company, Daniel Albertine, an Austrian dirt stower, who on this occasion was driving a mule, struck at the mule with a cap piece, when the mule immediately kicked back, knocking his eye out.

On June 11, at Mine No. 2, operated by the Kansas and Texas Coal Company, John Ebberley, a German miner, was injured by the fall of a piece of slate from the roof, known as a pot slip.

Résumé and comparative statement of accidents for years ended June 30, 1894, 1895, 1896, 1897, and 1898.

CAUSES OF ACCIDENTS.

	Year ending June 30—					
	1894.	1895.	1896.	1897.	1898.	Total.
Fall of roof.....	13	13	7	14	9	56
Fall of coal.....	6	5	4	3	6	24
Explosion of fire damp.....	3	11	22	9	14	59
Run over or caught by pit car.....	7	13	10	11	8	49
Returning to shot.....	1	2	2		2	7
Drilling old shot.....	2					2
Powder explosion.....	3	1				4
Dynamite explosion.....	1		3			4
Accident from hoisting machinery.....	6		1	1		10
Railroad car door falling.....	1					1
Pit car falling down shaft.....		1				1
Premature explosion of shot.....			2	1	2	5
Falling on rail.....						1
Fall of crossbar.....			1			1
Caught between cage and shaft.....			1	1	1	3
Caught by descending cage or by ascending cage.....			1	3		4
Fall of dirt in strip pit.....			1			1
Falling off pit top.....			1			1
Falling down slope.....			1			1
Caught by flying shot.....				1		1
Kicked by mule.....				2	1	3
Explosion from windy shot.....					4	4
Suffocated by powder smoke.....					1	1
Suffocated by smoke from fire.....					2	2
Boiler explosion.....					1	1
Total.....	43	46	58	46	51	244

ACCIDENTS, BY COMPANIES.

Choctaw, Oklahoma and Gulf R. R. Co.....	23	27	23	20	26	119
Osage Coal and Mining Co.....	12	12	8	1	1	34
Atoka Coal and Mining Co.....	3	3	7	7	5	25
Southwestern Coal and Improvement Co.....	5	3	7	5	5	25
Kansas and Texas Coal Co.....		1	6	6	10	23
Kiowa Coal and Mining Co.....			2			2
McAlester Coal and Coke Co.....			2	3		5
Savanna Coal Mining and Trading Co.....			1	1		2
Choctaw Coal and Mining Co.....			1			1
Choctaw Coal and Coke Co.....			1			1
Cavanal Coal, Coke and Railway Co.....				1		1
Edwards & Son.....					1	1
McAlester Coal and Mineral Co.....				1		1
Jensen Coal Co.....			1			1
Ola Coal and Mining Co.....					2	2
Milby and Dow Coal Co.....					1	1
Total.....	43	46	58	46	51	244

FATAL ACCIDENTS, BY CAUSES.

Gas explosion.....	2	1	6	5	3	17
Fall of roof.....	5	1		9	1	16
Caught by pit car.....	1	2	3	2	2	10
Fall of coal.....	1		2	2	1	6
Powder explosion.....	3					3
Dynamite explosion.....	1					1
Returning to shot.....		2	1		1	4
Fell from cage.....				1		1
Kicked by mule.....				1		1
Caught by ascending cage.....					1	1
Caught by flying shot.....				1		1
Explosion from windy shot.....					2	2
Premature explosion of shot.....					2	2
Suffocated by powder smoke.....					1	1
Suffocated by smoke from fire.....					2	2
Boiler explosion.....					1	1
Total.....	13	6	12	22	17	70

Résumé and comparative statement of accidents for years ending June 30, 1894, etc. —Cont'd.

FATAL ACCIDENTS, BY COMPANIES.

	Year ending June 30—					Total.
	1894.	1895.	1896.	1897.	1898.	
Choctaw, Oklahoma and Gulf R. R. Co	8	4	7	14	10	43
Osage Coal and Mining Co	2	1	.....	1	.....	4
Southwestern Coal and Improvement Co	1	1	2	.....	4	9
Atoka Coal and Mining Co	2	.....	.....	2	.....	4
McAlester Coal and Coke Co .....	.....	.....	1	.....	.....	1
Kiowa Coal and Mercantile Co .....	.....	.....	1	.....	.....	1
Choctaw Coal and Mineral Co .....	.....	.....	1	.....	.....	1
McAlester Coal and Mineral Co .....	.....	.....	.....	1	.....	1
Kansas and Texas Coal Co .....	.....	.....	.....	3	1	4
Milby & Dow Coal Co .....	.....	.....	.....	.....	1	1
D. Edwards & Son .....	.....	.....	.....	.....	1	1
Total	18	6	12	22	17	70

Following is a copy of the act of Congress for the protection of the lives of the miners in the Territories:

AN ACT FOR THE PROTECTION OF THE LIVES OF MINERS IN THE TERRITORIES.

[Public No. 165.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in each organized and unorganized Territory of the United States wherein are located coal mines the aggregate annual output of which shall be in excess of one thousand tons per annum the President shall appoint a mine inspector, who shall hold office until his successor is appointed and qualified. Such inspector shall, before entering upon the discharge of his duties, give bond to the United States in the sum of two thousand dollars, conditioned for the faithful discharge of his duties.

SEC. 2. That no person shall be eligible for appointment as mine inspector under section one of this act who is not either a practical miner or mining engineer and who has not been a resident for at least six months in the Territory for which he shall be appointed; and no person who shall act as land agent, manager, or agent of any mine, or as mining engineer, or be interested in operating any mine in such Territory, shall be at the same time an inspector under the provisions of this act.

SEC. 3. That it shall be the duty of the mine inspector provided for in this act to make careful and thorough inspection of each coal mine operated in such Territory, and to report at least annually upon the condition of each coal mine in said Territory, with reference to the appliances for safety of the miners, the number of air or ventilating shafts, the number of shafts or slopes for ingress or egress, the character and condition of the machinery for ventilating such mines, and the quantity of air supplied to the same. Such reports shall be made to the governor of the Territory in which such mines are located and a duplicate thereof forwarded to the Secretary of the Interior, and in the case of an unorganized Territory directly to the Secretary of the Interior.

SEC. 4. That in case the said mine inspector shall report that any coal mine is not properly constructed or not furnished with reasonable and proper machinery and appliances for the safety of the miners and other employees, it shall be the duty of the governor of such organized Territory, it shall be the duty of the Secretary of the Interior, to give notice to the owners or managers of said coal mine that the said mine is unsafe, and notifying them in what particular the same is unsafe, and requiring them to furnish and provide such additional machinery, slopes, entries, means of escape, ventilation, or other appliances necessary to the safety of the miners and other employees within a period to be in said notice named, and if the same be not furnished as required in such notice it shall be unlawful after the time fixed in such notice for the said owners or managers to operate said mine.

SEC. 5. That in all coal mines in the Territories of the United States the owners or managers shall provide at least two shafts, slopes, or other outlets, separated by natural strata of not less than one hundred and fifty feet in breadth, by which shafts, slopes, or outlets distinct means of ingress and egress shall always be available to the persons employed in said mine. And in case of the failure of any coal mine to be so provided it shall be the duty of the mine inspector to make report of such fact

and thereupon notice shall issue, as provided in section four of this act, and with the same force and effect.

SEC. 6. That the owners or managers of every coal mine at a depth of one hundred feet or more shall provide an adequate amount of ventilation of not less than fifty-five cubic feet of pure air per second, or thirty-three hundred cubic feet per minute, for every fifty men at work in said mine, and in like proportion for a greater number, which air shall, by proper appliances and machinery, be forced through such mine to the face of each and every working place so as to dilute and render harmless, and expel therefrom, the noxious or poisonous gases; and all workings shall be kept clear of standing gas.

SEC. 7. That any mine owner or manager who shall continue to operate a mine after failure to comply with the requirements of this act, and after the expiration of the period named in the notice provided for in section four of this act, shall be deemed guilty of a misdemeanor and shall be fined not to exceed five hundred dollars.

SEC. 8. That in no case shall a furnace shaft be used or for the purposes of this act be deemed an escape shaft.

SEC. 9. That escape shafts shall be constructed in compliance with the requirements of this act within six months from the date of the passage hereof, unless the same shall be extended by the mine inspector, and in no case shall said time be extended to exceed one year from the passage of this act.

SEC. 10. That a metal speaking tube from the top to the bottom of the shaft or slope shall be provided in all cases, so that conversation may be carried on through the same.

SEC. 11. That an approved safety catch shall be provided and sufficient cover overhead on every carriage used in lowering or hoisting persons; and the mine inspector shall examine and pass upon the adequacy and safety of all such hoisting apparatus.

SEC. 12. That no child under twelve years of age shall be employed in the underground workings of any mine; and no father or other person shall misrepresent the age of anybody so employed. Any person found guilty of violating the provisions of this section shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not to exceed one hundred dollars.

SEC. 13. That only experienced and competent and sober men shall be placed in charge of hoisting apparatus or engines; and the maximum number of persons who may ascend or descend upon any cage or hoisting apparatus shall be determined by the mine inspector.

SEC. 14. That it shall be lawful for any inspector to enter and inspect any coal mine in his district and the work and machinery belonging thereto at all reasonable times, but so as not to impede or obstruct the working of the mine, and to make inquiry into the state of the mine works and machinery, and the ventilation and mode of lighting the same, and into all matters and things connected with or relating to the safety of the persons employed in or about the same, and especially to make inquiry whether the provisions of this act are complied with, and the owner or agent is hereby required to furnish means necessary for such entry, inspection, examination, and inquiry, of which the said inspector shall make an entry in the record in his office, noting the time and material circumstances of the inspection.

SEC. 15. That in all cases of fatal accident a full report thereof shall be made by the mine owner or manager to the mine inspector, said report to be in writing and made within ten days after such death shall have occurred.

SEC. 16. That as a cumulative remedy, in case of the failure of any owner or manager of any mine to comply with the requirements contained in the notice of the governor of such Territory or the Secretary of the Interior, given in pursuance of this act, any court of competent jurisdiction, or the judge of such court in vacation, may, on the application of the mine inspector in the name of the United States and supported by the recommendation of the governor of said Territory or of the Secretary of the Interior, issue an injunction restraining the further operation of such mine until such requirements are complied with, and in order to obtain such injunction no bond shall be required.

SEC. 17. That wherever the term "owner or manager" is used in this act the same shall include lessees or other persons controlling the operation of any mine. And in case of violation of the provisions of this act by any corporation, the managing officers and superintendents and other managing agents of such corporation shall be personally liable and shall be punished as provided in act for owners and managers.

SEC. 18. That the mine inspectors provided for in this act shall each receive a salary of two thousand dollars per annum and their actual traveling expenses when engaged in their duties.

SEC. 19. That whenever any organized Territory shall make or has made provision by law for the safe operation of mines within such Territory, and the governor of such Territory shall certify said fact with a copy of the said law to the Secretary of the Interior, then and thereafter the provisions of this act shall no longer be

enforced in such organized Territory, but in lieu thereof the statute of such Territory shall be operative in lieu of this act.

Approved, March 3, 1891.

The act of Congress for the protection of the people of the Indian Territory, and for other purposes, approved June 28, 1898, known as the "Curtis bill," makes the following provisions which affect the coal-mining industry:

SEC. 15. * * * The person authorized by the tribe or tribes may execute or deliver to any such purchaser, without expense to him, a deed conveying to him the title to such lands or town lots, and thereafter the purchase money shall become the property of the tribe, and all such moneys shall, when titles to all the lots in the towns belonging to any tribe have been thus perfected, be paid per capita to the members of the tribe: *Provided, however*, That in those town sites designated and laid out under the provisions of this act where coal leases are now being operated and coal is being mined there shall be reserved from appraisement and sale all lots occupied by houses of miners actually engaged in mining, and only while they are so engaged, and in addition thereto a sufficient amount of land, to be determined by the appraisers, to furnish homes for the men actually engaged in working for the lessees operating said mines, and a sufficient amount for all buildings and machinery for mining purposes: *And provided further*, That when the lessees shall cease to operate said mine, then and in that event the lots of land so reserved shall be disposed of as provided for in this act.

SEC. 16. That it shall be unlawful for any person, after the passage of this act, except as hereinafter provided, to claim, demand, or receive, for his own use, or for the use of anyone else, any royalty on oil, coal, asphalt, or other mineral, or on any timber or lumber, or any other kind of property whatsoever, or any rents on any lands or property belonging to any one of said tribes or nations in said Territory, or for anyone to pay to any individual any such royalty or rents or any consideration therefor whatsoever; and all royalties and rents hereafter payable to the tribe shall be paid, under such rules and regulations as may be prescribed by the Secretary of the Interior, into the Treasury of the United States to the credit of the tribe to which they belong: *Provided*, That where any citizen shall be in possession of only such amount of agricultural or grazing lands as would be his just and reasonable share of the lands of his nation or tribe, and that to which his wife and minor children are entitled, he may continue to use the same or receive the rents thereon until allotment has been made to him: *Provided further*, That nothing herein contained shall impair the rights of any member of a tribe to dispose of any timber contained in his, her, or their allotment.

SEC. 17. That it shall be unlawful for any citizen of any one of said tribes to inclose or in any manner, by himself or through another, directly or indirectly, to hold possession of any greater amount of lands or other property belonging to any such nation or tribe than that which would be his approximate share of the lands belonging to such nation or tribe and that of his wife and his minor children as per allotment herein provided; and any person found in such possession of lands or other property in excess of his share and that of his family, as aforesaid, or having the same in any manner inclosed, at the expiration of nine months after the passage of this act, shall be deemed guilty of a misdemeanor.

SEC. 18. That any person convicted of violating any of the provisions of sections sixteen and seventeen of this act shall be deemed guilty of a misdemeanor and punished by a fine of not less than one hundred dollars, and shall stand committed until such fine and costs are paid, such commitment not to exceed one day for every two dollars of said fine and costs, and shall forfeit possession of any property in question and each day on which such offense is committed or continues to exist shall be deemed a separate offense. And the United States district attorneys in said territory are required to see that the provisions of said sections are strictly enforced and they shall at once proceed to dispossess all persons of such excessive holdings of land and to prosecute them for so unlawfully holding the same.

If, however, the Choctaw or Chickasaw tribe of Indians ratify the agreement known as the Dawes agreement, then, instead of the foregoing, the following provisions become law:

It is agreed that all the coal and asphalt within the limits of the Choctaw and Chickasaw nations shall remain and be the common property of the members of the Choctaw and Chickasaw tribes (freedmen excepted), so that each and every member shall have an equal and undivided interest in the whole; and no patent provided for in this agreement shall convey any title thereto. The revenues from coal and asphalt, or so much as shall be necessary, shall be used for the education of the children of Indian blood of the members of said tribes. Such coal and asphalt mines as are now in

operation, and all others which may hereafter be leased and operated, shall be under the supervision and control of two trustees, who shall be appointed by the President of the United States, one on the recommendation of the principal chief of the Choctaw Nation, who shall be a Choctaw by blood, whose term shall be for four years, and one on the recommendation of the governor of the Chickasaw Nation, who shall be a Chickasaw by blood, whose term shall be for two years, after which the term of appointees shall be four years. Said trustees, or either of them, may, at any time, be removed by the President of the United States for good cause shown. They shall each give bond for the faithful performance of their duties, under such rules as may be prescribed by the Secretary of the Interior. Their salaries shall be fixed and paid by their respective nations, each of whom shall make full report of all his acts to the Secretary of the Interior quarterly. All such acts shall be subject to the approval of said Secretary.

All coal and asphalt mines in the two nations, whether now developed or to be hereafter developed, shall be operated and the royalties therefrom paid into the Treasury of the United States, and shall be drawn therefrom under such rules and regulations as shall be prescribed by the Secretary of the Interior.

All contracts made by the national agents of the Choctaw and Chickasaw nations for operating coal and asphalt with any person or corporation, which were on April twenty-third, eighteen hundred and ninety-seven, being operated in good faith, are hereby ratified and confirmed, and the lessee shall have the right to renew the same when they expire, subject to all the provisions of this act.

All agreements heretofore made by any person or corporation with any member or members of the Choctaw or Chickasaw nations, the object of which was to obtain such member or members' permission to operate coal or asphalt, are hereby declared void: *Provided*, That nothing herein contained shall impair the rights of any holder or owner of a leasehold interest in any oil, coal rights, asphalt, or mineral which have been assented to by act of Congress, but all such interests shall continue unimpaired hereby, and shall be assured by new leases from such trustees of coal or asphalt claims described therein, by application to the trustees within six months after the ratification of this agreement, subject, however, to payment of advance royalties herein provided for.

All leases under this agreement shall include the coal or asphaltum or other mineral as the case may be in or under nine hundred and sixty acres, which shall be in a square as nearly as possible, and shall be for thirty years. The royalty on coal shall be fifteen cents per ton of two thousand pounds on all coal mined, payable on the twenty-fifth day of the month next succeeding that in which it is mined. Royalty on asphalt shall be sixty cents per ton, payable same as coal: *Provided*, That the Secretary of the Interior may reduce or advance royalties on coal and asphalt when he deems it for the best interests of the Choctaws and Chickasaws to do so. No royalties shall be paid, except into the United States Treasury, as herein provided.

All lessees shall pay on each coal or asphalt claim at the rate of one hundred dollars per annum in advance for the first and second years, two hundred dollars per annum in advance for the third and fourth years, and five hundred dollars for each succeeding year thereafter. All such payments shall be treated as advance royalty on the mine or claim on which they are made, and shall be a credit as royalty when each said mine is developed and operated and its production is in excess of such guaranteed annual advance payments, and all persons having coal leases must pay said annual advance payments on each claim whether developed or undeveloped: *Provided, however*, That should any lessee neglect or refuse to pay such advanced annual royalty for the period of sixty days after the same becomes due and payable on any lease, the lease on which default is made shall become null and void, and the royalties paid in advance thereon shall then become and be the money and property of the Choctaw and Chickasaw nations.

In surface, the use of which is reserved to present coal operators, shall be included such lots in towns as are occupied by lessees' houses, either occupied by said lessees' employees or as offices or warehouses: *Provided, however*, That in those town sites designated and laid out under the provision of this agreement, where coal leases are now being operated and coal is being mined, there shall be reserved from appraisal and sale all lots occupied by houses of miners actually engaged in mining, and only while they are so engaged, and in addition thereto a sufficient amount of land, to be determined by the town-site board of appraisers, to furnish homes for the men actually engaged in working for the lessees operating said mines, and a sufficient amount for all buildings and machinery for mining purposes: *And provided further*, That when the lessees shall cease to operate said mines, then, and in that event, the lots of land so reserved shall be disposed of by the coal trustees for the benefit of the Choctaw and Chickasaw tribes.

That whenever the members of the Choctaw and Chickasaw tribes shall be required to pay taxes for the support of schools, then the fund arising from such royalties shall be disposed of for the equal benefit of their members (freedmen excepted) in such manner as the tribes may direct.

It is further agreed that the United States courts now existing or that may hereafter be created in the Indian Territory shall have exclusive jurisdiction of all controversies growing out of the titles, ownership, occupation, possession, or use of real estate, coal, and asphalt in the territory occupied by the Choctaw and Chickasaw tribes, and of all persons charged with homicide, embezzlement, bribery, and embezzlement, breaches or disturbances of the peace, and carrying weapons, hereafter committed in the territory of said tribes, without reference to race or citizenship of the person or persons charged with such crime, and any citizen or officer of the Choctaw or Chickasaw nations charged with such crime shall be tried, and if convicted punished as though he were a citizen or officer of the United States.

These nations or tribes of Indians have until December 1 to accept the Dawes agreement, it being understood that if they fail to ratify said agreement, then the Curtis bill is operative.

There is much discussion and disagreement as to the desirability of accepting or resisting the agreement and the action of Congress, but it is to be hoped that an amicable understanding will be reached that parties contemplating development of the valuable coal fields as well as of other minerals may be encouraged to proceed with their operations.

GENERALLY.

The past year has been notably free from strikes or labor trouble, the miners appearing well satisfied to obtain work, but unfortunately during the summer months, owing to keen competition, many of the mines are idle and the men are unable to find sufficient work. It is to be noted that while the production of coal in the past five years has increased 50 per cent the number of men remains about the same, and doubtless these men have earned less money and worked fewer days than they did in 1894. This is owing to the establishment of electric machinery and other labor-saving devices. I desire to state that we have in force the most rigid rules in the mines regarding the setting of props and timbers to hold up the roofs, insuring the safety of the men in their working places, and a system of shot firers in every mine where gas and inflammable dust exists, and where there are liable to be explosions by reason of windy or blown-out shots. In every mine in the Territory that generates gas, men specially employed for the purpose visit each and every room or working place and mark the same with the day of the month on the face of the coal, and in case gas is found mark or dead line the entrance so that none may pass it until the same has been cleaned out. This is always done before the hour for commencing work in the morning, and after he has gone the rounds the men are then notified to enter their working places. None but competent men are employed to handle the machinery, and we have had no accident during the year caused by defective handling of hoisting machinery where men are hoisted or lowered. During the past year we have had, as hereinbefore indicated, 51 accidents, 17 of which proved fatal. These accidents were scattered along during the year and are accidents incident to the business, we having had nothing that could be classed as a disaster.

The output of coal for the fiscal year ending June 30, 1898, was 1,458,098 tons; number of men employed, 3,529.

COAL MEASURES
NEAR LOS CERRILLOS
SANTA FE. CO. N.M.

NO SCALE

SEVERAL SMALL SEAMS
NOT FULLY PROSPECTED
APPEAR FARTHER UP
THE CANON

UPPER ANTHRACITE



QUARTZITE OVERFLOW 50

COAL 1'8"

COAL 2'10"

SHALES & SANDSTONE 80'0"

COAL 4'0"

SHALES & SANDSTONE 40'0"

COAL 2'6"

REPORT
OF THE
UNITED STATES COAL-MINE INSPECTOR FOR THE
TERRITORY OF NEW MEXICO.

SILVER CITY, N. MEX., August 26, 1898.

SIR: In compliance with section 3 of an act of Congress approved March 3, 1891, entitled "An act for the protection of the lives of miners in the Territories," I herewith beg leave to submit the sixth annual report of this office, covering the fiscal year ended June 30, 1898.

JOHN W. FLEMING,
*United States Mine Inspector for the
Territory of New Mexico.*

The SECRETARY OF THE INTERIOR,
Washington, D. C.

OTERO MINE.

[Alex. Bowie, superintendent; John Steward, pit boss.]

Located about 2½ miles in an easterly direction from the town of Gallup, Bernalillo County, N. Mex. Owned and operated by the Caledonian Coal Company. Kind of coal, lignite; thickness of vein, 4 feet 6 inches; total output, fiscal year, 90,366 tons; estimated value of output, \$136,049; depth of slope, 1,300 feet; value of improvements this year, \$19,776.42; average number of men employed outside, 25; average number of men employed inside, 150; average number of boys employed, 2; where coal is marketed, Santa Fe Pacific Railroad and California; number of days mine worked, 248.

This mine is situated on a spur about 1 mile in length, connecting with the Santa Fe Pacific Railroad near Gallup Station, is operated by a slope 1,300 feet in length, and has a capacity of about 500 tons per day. The product is sold to the Santa Fe Pacific Railroad Company and to towns in California. This mine is ventilated by an air shaft and furnace.

RECORD OF INSPECTION.

September 18, 1897.—On this date I inspected the mine known as the Otero mine. I measured 4,500 cubic feet of air entering the mine per minute and measured 5,000 cubic feet of air returning through the return-air course. I found the ventilation good throughout the workings of the mine, and found the mine in very good condition.

November 11, 1897.—I again inspected the Otero mine. I measured 10,290 cubic feet of air entering the mine per minute and measured 10,550 cubic feet of air returning through the return-air course. I found the ventilation good throughout the workings of the mine and found the mine in good condition.

January 11, 1898.—I again inspected the Otero mine. I measured 12,080 cubic feet of air entering the mine per minute and measured 12,405 cubic feet of air returning

through the return-air course. I found the workings of the mine well ventilated and found the mine in fair working condition.

March 11, 1898.—I again inspected the Otero mine. I measured 8,050 cubic feet of air entering the mine per minute and measured 8,400 cubic feet of air returning through the return-air course. On this tour of inspection I found the miners working too far ahead of the air in Nos. 1 and 2 right butt entries, and ordered crosscuts driven at the face of the entries, so as to force the air to the face of the workings.

GALLUP MINE.

[Hugh McGinn, superintendent; James McQuade, pit boss.]

This mine is located about 3 miles northwest of the town of Gallup, Bernalillo County, N. Mex. Owned and operated by the Crescent Coal Company. Kind of coal, lignite; thickness of vein, 6 feet; total output, fiscal year, 141,145 tons; estimated value of output, \$220,000; depth of slope, 3,000 feet; value of improvements this year, not given; average number of men employed outside, 24; average number of men employed inside, 240; average number of boys employed, 5; where coal is marketed, New Mexico, Arizona, and California; number of days mine worked, 235.

RECORD OF INSPECTION.

September 21, 1897.—On this date I inspected the Gallup mine. The fan was running 90 revolutions per minute, and I measured 24,000 cubic feet of air entering the mine per minute and measured 24,075 cubic feet of air returning through the return air course. I took air measurements throughout the workings of the mine and found the air distributed in compliance with the law. On this visit the new air shaft had been sunk to a depth of 120 feet, which is to connect with No. 15, left entry, and when the connection with the shaft and entry is made the ventilation will be very much improved.

November 15, 1897.—I again inspected the Gallup mine. The fan was running 90 revolutions per minute, and I measured 30,000 cubic feet of air entering the mine per minute and measured 30,300 cubic feet of air returning through the return air course. I found the air distributed throughout the workings of the mine in compliance with the law. Found the workings well timbered and in good condition.

January 15, 1898.—On this date I inspected the machinery of the Gallup mine. I found the fan required some repairs and ordered the superintendent to have the necessary repairs made on the fan as soon as possible. I also inspected the new air shaft and found it to be 232 feet deep, but the connection had not been made with No. 15, left entry, and I ordered the superintendent to push the work as fast as possible.

SUNSHINE MINE.

[Hugh McGinn, superintendent.]

Located about 1½ miles north of the town of Gallup, Bernalillo County, N. Mex. Owned and operated by the Crescent Coal Company. Kind of coal, lignite; thickness of vein, 5 feet; total output, fiscal year, 48,450 tons; estimated value of output, \$80,000; depth of slope, 2,000 feet; value of improvements this year, none given; average number of men employed outside, 12; average number of men employed inside, 110; average number of boys employed, 3; where coal is marketed, New Mexico, Arizona, and California; number of days mine worked, 231.

This mine is located on a spur 1½ miles in length, connected with the Santa Fe Pacific Railroad; operated by a slope; capacity, about 500 tons per day; ventilated by a 12-foot Crawford & McCrimmon fan.

RECORD OF INSPECTION.

September 16, 1897.—On this date I inspected the Sunshine mine. The fan was running 65 revolutions per minute, and I measured 27,840 cubic feet of air entering the mine per minute and measured 25,200 cubic feet of air per minute returning through the return air course, thus making a difference of 2,640 cubic feet of air between the intake and outcast. This is caused by some of the air escaping into the old workings of the Black Diamond mine, which is abandoned. I found the ventilation good throughout the workings of the mine. Found places in the roof of the slope which required timbering and ordered said places timbered. The pit boss informed me that new timbers would be put in that night. Otherwise I found the mine in good condition.

November 13, 1897.—On this date I inspected the Sunshine mine. The fan was running 90 revolutions per minute, and I measured 26,460 cubic feet of air entering the

THERE ARE SEVERAL SMALL VEINS SHOWING IN CROP LINES ABOVE
THOSE GIVEN IN THIS SECTION, BUT THEY HAVE NEVER BEEN FULLY
PROSPECTED.—

A COPY.



SECTION OF STRATA OF THE
GALLUP COAL CO.'S NO. 8.

SCALE

NOTE.—

THE BLACK DIAMOND MINE IS WORKING A
VEIN 4 TO 6 FEET THICK, WHICH IS UNDER THOSE
GIVEN ABOVE. ALSO A 5 FOOT VEIN LOCATED BY
DRILL HOLE IN THE BOTTOM OF THE CROWN POINT
SHAFT WHICH IS STILL BELOW THE DIAMOND VEIN.

mine per minute and measured 26,250 cubic feet of air returning through the return air course. I found the mine well ventilated and found the workings of the mine in good condition.

January 12, 1898.—I again inspected the Sunshine mine. I measured 28,600 cubic feet of air entering the mine per minute and measured 28,800 cubic feet of air returning through the return air course. I found the mine well ventilated. Found No. 3 entry in bad condition and ordered the pit boss to have the entry timbered at once. The pit boss ordered the timbers brought into the mine and instructed the timbermen to timber the entry that night.

March 9, 1898.—On this date I again inspected the Sunshine mine. The fan was running 75 revolutions per minute, and I measured 40,000 cubic feet of air entering the mine per minute and measured 41,000 cubic feet of air returning through the return air course. I found the ventilation good throughout the workings of the mine and found the mine in very good condition.

CROWN POINT MINE.

[Hugh McGinn, superintendent; Archie Black, pit boss.]

This mine is located about 3 miles in a northerly direction from the town of Gallup, Bernalillo County, N. Mex. Owned and operated by the Crescent Coal Company. Kind of coal, lignite; thickness of vein, 3 feet 6 inches; total output, fiscal year, 61,194 tons; estimated value of output, \$92,000; depth of shaft, 225 feet; value of improvements this year, not given; average number of men employed outside, 12; average number of men employed inside, 140; average number of boys employed, 4; where coal is marketed, New Mexico, Arizona, and California; number of days mine worked, 231.

This mine is located on a spur 3 miles in length connecting with the Santa Fe Pacific Railroad near Gallup Station; is operated by a shaft 225 feet deep; capacity, about 250 tons per day; ventilated by a 12-foot Crawford & McCrimmon fan and an air shaft.

RECORD OF INSPECTION.

September 17, 1897.—On this date I inspected the Crown Point mine. The fan was running 60 revolutions per minute, and I measured 16,660 cubic feet of air entering the mine per minute and measured 16,800 cubic feet of air returning through the return air course. I found the ventilation good throughout the workings of the mine. I found the mine in good condition.

November 12, 1897.—I again inspected the Crown Point mine. The fan was running 85 revolutions per minute, and I measured 17,920 cubic feet of air entering the mine per minute and measured 18,000 cubic feet of air returning through the return air course. I found the roof of No. 1 straight entry in bad condition and ordered the pit boss to have the loose rock taken down and the entry timbered with good, substantial timber.

January 13, 1898.—I again inspected the Crown Point mine. The fan was running 70 revolutions per minute, and I measured 19,950 cubic feet of air entering the mine per minute and measured 21,840 cubic feet of air returning through the return air course. I found the air distributed in compliance with the law. Found several places along No. 1 straight entry which required timbering and ordered the pit boss to have said places timbered as soon as possible, and the pit boss informed me that the work would be commenced at once. The timbermen were ordered to proceed with the work.

March 12, 1898.—I again inspected the Crown Point mine. The fan was running 85 revolutions per minute, and I measured 19,950 cubic feet of air entering the mine per minute and measured 20,540 cubic feet of air returning through the return air course. I found the mine well ventilated and found the working places well timbered. I found that the escape shaft did not have stations or landing places in the shaft and I ordered the general manager, W. Weaver, to have stations erected in the shaft, at a distance of 30 feet apart, from the top to the bottom, and have the stations put in as soon as possible. The general manager informed me that he would comply with my request.

CATALPA MINE.

[Hugh McGinn, superintendent.]

Located about 3 miles in a southeasterly direction from the town of Gallup, Bernalillo County, N. Mex. Owned and operated by the Crescent Coal Company. Kind of coal, lignite; thickness of vein, 6 feet; total output for fiscal year, 4,356 tons; estimated value of output, \$8,000; depth of slope, 1,000 feet; value of improvements

this year, not given; average number of men employed outside, 8; average number of men employed inside, 60; where coal is marketed, New Mexico, Arizona, and California; number of days mine worked, 46.

This mine is situated on a spur 3 miles in length connecting with the Santa Fe Pacific main line near Gallup Station. Capacity is about 300 tons per day, and is ventilated by an air shaft. This has not been worked to any extent. All that has been done was in the way of development and of getting the property in readiness for use at any time when there was demand for the product.

RECORD OF INSPECTION.

September 14, 1897.—On this date I inspected the Catalpa mine. At the time of my inspection there were only two miners employed in the mine.

November 18, 1897.—I again inspected the Catalpa mine and found only two miners employed in the mine. Workings in good condition.

ROCKY CLIFF MINE.

[Stephen Canavan, general manager; William Steward, pit boss.]

This mine is located about 2 miles in an easterly direction from the town of Gallup, Bernalillo County, N. Mex. Owned and operated by Stephen Canavan. Kind of coal, lignite; thickness of vein, 4 feet 6 inches; output for fiscal year, 22,000 tons; estimated value of output, \$33,000; depth of slope, 900 feet; value of improvements this year, \$4,300; average number of men employed outside, 3; average number of men employed inside, 32; where coal is marketed, Arizona and California; number of days mine worked, 250.

This mine is located on a spur about 2 miles in length connecting with the Santa Fe Pacific Railroad near Gallup Station. It is ventilated by a furnace. Capacity, 150 tons.

RECORD OF INSPECTION.

September 15, 1897.—On this date I inspected the Rocky Cliff mine. Measured 6,300 cubic feet of air entering the mine per minute and measured 6,475 cubic feet of air per minute returning through the return air course. I found the mine to be well ventilated and found the workings in good condition.

November 16, 1897.—I again inspected the Rocky Cliff mine. I measured 2,730 cubic feet of air entering the mine per minute and measured 3,040 cubic feet of air returning through the return air course. I found men working too far ahead of the air on the first left entry, also on first right entry, and ordered the pit boss to have cross cuts driven at the face of the entries. I also found the straight entry, or hauling road, in bad condition and ordered it timbered. The pit boss informed me the work of timbering the entry would be commenced at once.

January 10, 1898.—I again inspected the Rocky Cliff mine. I measured 6,500 cubic feet of air entering the mine per minute and measured 6,550 cubic feet of air returning through the return air course. I found the ventilation good throughout the workings of the mine and found the mine in good condition.

March 9, 1898.—I again inspected the Rocky Cliff mine, and measured 5,510 cubic feet of air entering the mine per minute and measured 6,450 cubic feet of air returning through the return-air course. I found the ventilation good throughout the workings of the mine, but found the main hauling roads to be very dusty, and ordered Mr. Canavan, the general manager, to have the roads cleaned and haul the dust out of the mine. Before I took my departure from Gallup the work of cleaning the dust out of the mine was performed.

W. A. CLARK COAL MINE.

[W. L. Bretherton, agent.]

This mine is located about 5 miles west of the town of Gallup, Bernalillo County, N. Mex. Owned and operated by W. A. Clark. This is a new mine, development having been commenced December 30, 1897. Kind of coal, lignite; thickness of vein, 7 feet; total output since December 30, 1897, to June 30, 1898, 3,500 tons; estimated value of output, \$4,000; length of drift, 600 feet; value of improvements, not given; average number of men employed outside, 30; average number of men employed inside, 50; where coal is marketed, Jerome, Ariz.; number of days mine worked, producing coal, 30.

RECORD OF INSPECTION.

January 17, 1898.—On this date I inspected the W. A. Clark mine. At the time of my visit to the mine, 4 miners were employed therein. On this date the development work on this mine consisted of one entry driven 140 feet on a vein of coal; one entry 75 feet, and a shaft sunk to a depth of 40 feet. The vein of coal is 7 feet thick, and is a good quality of lignite coal. The mine has every indication of being a large producer in the near future.

MULHOLLAND & CASNA MINE.

[Gus Mulholland, general manager.]

This mine is located 2½ miles west of the town of Gallup, Bernalillo County, N. Mex., and is being operated by Gus Mulholland and Andrea Casna. The coal is hauled in wagons to Gallup Station and shipped to southern California. This is a new mine, development work having been commenced in the month of July, 1897. Kind of coal mined, lignite; thickness of vein, 4 feet; total output, fiscal year, 200 tons; estimated value of output, \$400; depth of slope, 500 feet; total value of improvements, \$4,000; average number of men employed, outside, 2; average number of men employed, inside, 4; where coal is marketed, southern California; number of days mine worked, 90.

RECORD OF INSPECTION.

September 22, 1897.—On this date I visited the Mulholland & Casna mine. This mine has a shaft 70 feet deep, at the bottom of which a vein of coal 4 feet in thickness was developed. Also a slope has been driven a distance of 230 feet for the purpose of making connection with the shaft, which will be used as an air shaft. At the time of my visit the connection had not been made. Seven men were employed at the mine.

November 17, 1897.—I again inspected the Mulholland & Casna mine. I found the slope which was being driven to connect with the shaft had been completed and the vein of coal had been encountered, showing the vein of coal to be 4 feet in thickness. Eight miners were employed in the mine. Found the workings of the mine in very good condition.

January 14, 1898.—I again inspected the Mulholland & Casna mine. I measured 4,600 cubic feet of air entering the mine per minute and found the ventilation good throughout the workings of the mine. Since my previous visit to this mine three rooms had been turned off from the main entry. I found the roof of No. 2 room in a dangerous condition, and ordered Mr. Mulholland to have props put in at once, so as to make the roof of the room secure from all danger. The props were brought into the mine and the work commenced at once. On this visit only four men were employed in the mine. This mine is not being operated at present.

BEACON HILL MINE.

[Theodore A. Fabro, general manager.]

This mine is located about 1½ miles south of the town of Gallup, Bernalillo County, N. Mex. The coal is hauled in wagons and sold for domestic use in Gallup, N. Mex. Kind of coal, lignite; thickness of vein, 6 feet; total output, fiscal year, 600 tons; estimated value of output, \$1,080; depth of slope, 900 feet; value of improvements this year, \$420; average number of men employed outside, 1; average number of men employed inside, 2; number of days mine worked, 110.

RECORD OF INSPECTION.

September 23, 1897.—On this date I inspected the Beacon Hill mine. I inspected the workings and found them in good condition. The mine was not being operated on this date.

January 19, 1898.—I again inspected the Beacon Hill mine. At the time of my visit to the mine only four miners were employed therein, and I found the workings of the mine in good condition. On account of the few men employed in this mine I did not deem it necessary to make further inspections of the same.

CANAVAN & BAILEY MINE.

[Thomas Cross, general manager.]

Located about three-fourths of a mile in a northwesterly direction from the town of Gallup, Bernalillo County, N. Mex. Owned and operated by the Summit Coal Company. Kind of coal, lignite; thickness of vein, 5 feet; total output, fiscal year,

800 tons; estimated value of output, \$1,200; average number of employees inside, 6; average number of employees outside, 2; length of slope, 650 feet; number of days mine worked, 65.

The product of this mine is hauled to Gallup Station, N. Mex., and shipped to California. Some of the coal is also sold to the local market at Gallup, N. Mex.

RECORD OF INSPECTION.

September 20, 1897.—On this date I inspected the Canavan & Bailey mine. I found the main air course in bad condition, having been partially filled with falls of rock from the roof of the air course. I ordered the general manager to have the air course cleared of the falls of rock. I was informed by the general manager that the work of clearing the air course would be commenced at once.

November 10, 1897.—I again inspected the Canavan & Bailey mine. On this visit to the mine I found the mine in fair working condition. There were only three miners employed in the mine.

January 7, 1898.—I again inspected the Canavan & Bailey mine. On this date the mine was not being operated, but I found the workings of the mine in good condition. I also inspected the machinery and found the hoisting machinery, boilers, and ropes in good condition.

BLOSSBURG MINE.

[J. A. Wiggs, superintendent; James Walsh, pit boss.]

Located near Gardiner, about 4½ miles in a westerly direction from the town of Raton, Colfax County, N. Mex. This mine is owned and operated by the Raton Coal and Coke Company. Kind of coal, bituminous; thickness of vein varies from 6 to 8 feet; total output, fiscal year, 210,000 tons; estimated value of output, this year, \$357,500; average number of men employed in and out side, 350; average number of boys employed, 10; length of drift, 9,000 feet; mine in operation, 240 days.

This mine is located on a branch of the Atchison, Topeka and Santa Fe Railroad, connecting with the main line at Dillon Station. This is the largest mine in the Territory, having a capacity of 1,500 tons per day. It is operated upon the double-entry system. The product is sold to the Atchison, Topeka and Santa Fe and the Mexican Central railroads.

RECORD OF INSPECTION.

October 7, 1897.—On this date I inspected the hoisting machinery of the Blossburg mine; also the boilers, ropes, cars, chains, etc., and found the machinery in good condition.

October 8, 1897.—I inspected the underground workings on the left side of the main entry in the Blossburg mine, and found the workings to be in good condition.

October 9, 1897.—I again inspected the Blossburg mine. I measured 17,680 cubic feet of air entering the mine per minute, and found the air distributed throughout the workings as follows, viz:

	Cubic feet air.
Face of main entry	1,680
Last crosscut between seventh and eighth right entries	8,000
Last crosscut between ninth and tenth right entries	8,000

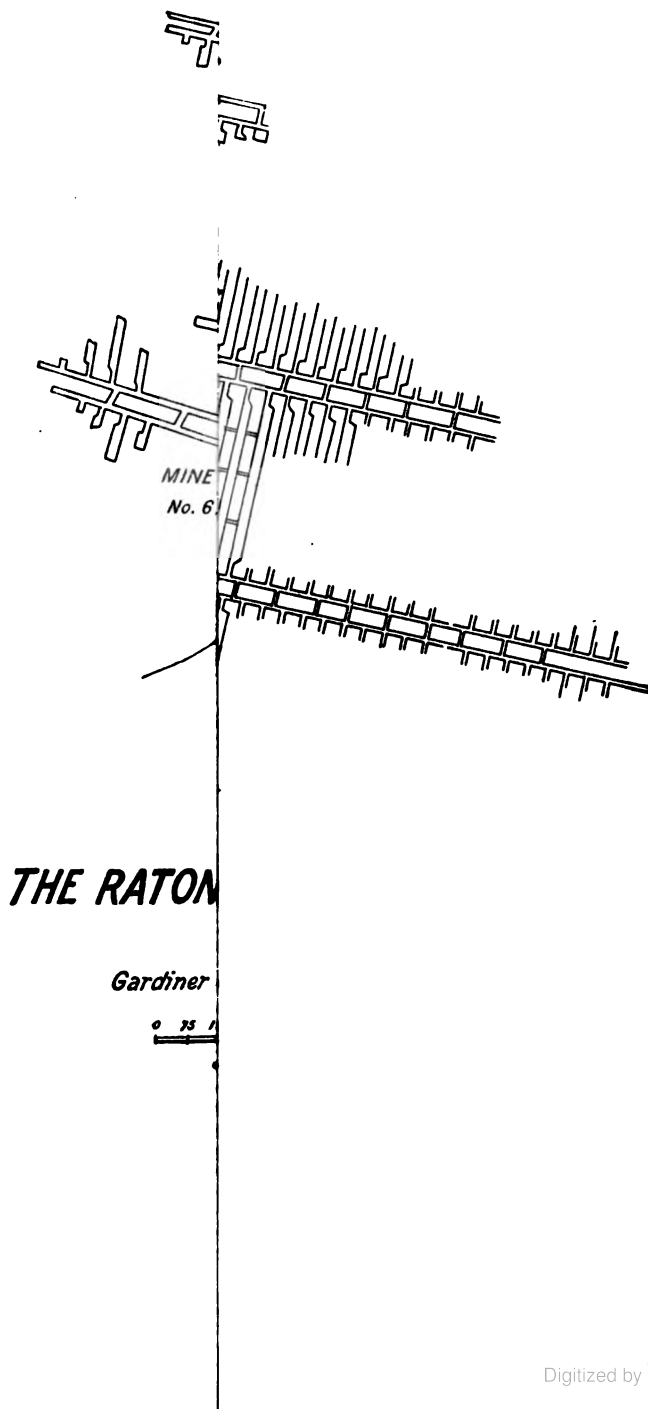
I found a large fall of rock on No. 10, right entry, and ordered the pit boss to have the entry cleared of the fall of rock. The mine was not being operated on this date.

December 8, 1897.—I visited the Blossburg mine for the purpose of inspecting room No. 20, which is located on the right cross entry, in which room a fatal accident had occurred, causing the death of William Sartoris. (See report of fatal accidents.)

December 9, 1897.—I inspected the underground workings of the Blossburg mine. I measured 18,840 cubic feet of air entering the mine per minute, and measured 19,040 cubic feet of air per minute returning through the return-air course. I found the mine to be well ventilated, but found some of the timbers broken in Nos. 9 and 10, right entries, and ordered them replaced with new ones; otherwise I found the mine in good condition.

February 9, 1898.—I again inspected the Blossburg mine. I found the roof of main entry in a dangerous condition, and ordered the entry timbered in all places where the roof was not safe. The pit boss ordered the timbering of the entry commenced at once.

February 10, 1898.—I again inspected the Blossburg mine. I measured 8,160 cubic feet of air entering the mine per minute, and measured 6,545 cubic feet of air traveling in No. 18, left entry. I found the roof of Nos. 12, 13, and 14 rooms on No. 18, left entry, in a dangerous condition and had props put in to secure the roofs of said mentioned places.



February 11, 1898.—On this date a new 25-foot Monongahela Guible fan was started on the Blossburg mine, which is run by a 50-horsepower electric motor. The fan was running 60 revolutions per minute and I took air measurements throughout the workings of the mine. I measured 37,500 cubic feet of air entering the mine per minute, making a difference of 29,340 cubic feet of air in favor of the new fan. I then took air measurements throughout the workings and found the measurements to be as follows, viz:

	Cubic feet air.
Last crosscut between Nos. 3 and 4, left entries	5,280
Face of diagonal entry	27,360
Last crosscut between Nos. 13 and 14, right entries	9,350
Last crosscut between Nos. 11 and 12, right entries	11,230
No. 11, right entry	12,600
Face of pillars of Nos. 9 and 10, right entries	8,550
Return to fan	39,000

I found the new fan had very much improved the ventilation throughout the workings of the mine. On this visit to the mine I found that the company had erected water tanks inside the mine at a point about the center of the workings; and the company were laying a pipe line from the outside of the mine to the tanks. When the pipe line is completed the water will be pumped into the tanks for the purpose of sprinkling the inside workings, also to be used in case of a fire occurring in the mine.

February 12, 1898.—I again visited the Blossburg mine for the purpose of ascertaining if the new fan was working satisfactorily. I found that the fan was running in perfect order and giving perfect satisfaction, but I ordered the superintendent to keep the old fan in place for at least two weeks, or until such time as he was satisfied with the workings of the new machinery being a perfect success.

March 24, 1898.—I again inspected the Blossburg mine. I found the roof of No. 1 right entry in a bad condition and ordered the pit boss to have the entry timbered at once. The timbers were brought into the mine and men were ordered to timber the roof near the face of the workings before mining any more coal.

March 25, 1898.—I again inspected the Blossburg mine. The fan was running 60 revolutions per minute and I measured 34,560 cubic feet of air entering the mine per minute and measured 36,015 cubic feet returning per minute. I found the roof of Nos. 3, 4, 5, 6, 7, and 8 rooms on No. 18 left entry in a bad and dangerous condition and ordered the rooms timbered at once. I also found the main hauling roads to be very dusty and ordered the roads sprinkled with water.

March 26, 1898.—On this date I returned to the Blossburg mine for the purpose of ascertaining if my orders of the 25th had been complied with. I found that the work of timbering the rooms had been completed, but the hauling roads had not been sprinkled. The pit boss assured me that the hauling roads would be sprinkled on the next day (Sunday) while the mine was not in operation.

March 28, 1898.—On this date I was informed that the main pipe line of Blossburg mine, which supplies the boilers with water, had burst, and knowing that as the water got low in the boilers the fan would necessarily have to stop on account of having no steam to run the machinery, I therefore proceeded to the mine at once and ordered the pit boss to notify all the miners and others who were in the mine to get out of the mine as soon as possible. The pit boss notified the miners and had them all to come out. I then notified the pit boss not to allow any of the miners to enter the mine till the fan had been running three hours and the workings thoroughly examined by the fire bosses.

April 20, 1898.—I again inspected the Blossburg mine. I found the miners working too far in advance of the air, and ordered a crosscut driven at the face of No. 1 right entry and make connection with the air course. The pit boss instructed the miners to commence driving the crosscut at once.

April 21, 1898.—I again inspected the Blossburg mine. I measured 33,600 cubic feet of air entering the mine per minute. I then inspected Nos. 1, 2, 3, and 4 left entries. I found the ventilation good throughout the workings. While inspecting the workings above mentioned, I found a place in the back entry off from the main entry about the center of the mine where a keg of black powder had been scattered promiscuously for a distance of 75 feet. I came to the conclusion that some person maliciously inclined must have scattered the powder with the full intent of blowing up the mine and killing every person therein, for had some innocent miner ignited the powder with his lamp a dust explosion would undoubtedly have followed, which would have caused the loss of every life in the mine. As soon as I discovered the powder I immediately had water hauled to the place, had it flooded and had the entry cleaned of all powder and dust and had it hauled out of the mine. The superintendent was informed of the condition so found, the great danger, etc. He immediately employed two guards whose duty it is to keep a constant watch on all the men employed in the mine, and to allow no person to enter the mine who is not

employed therein, also to use every effort to ascertain the parties who were guilty of scattering the powder in the entry.

April 22, 1898.—I again inspected the Blossburg mine and took air measurements, and found the mine well ventilated.

June 24, 1898.—I again inspected Blossburg mine. I found the miners working too far in advance of the air in No. 1 right entry, and ordered the pit boss to have a crosscut driven between No. 1 right entry and the back air course; also, ordered the face of the entry timbered.

June 25, 1898.—I again inspected the Blossburg mine. Inspected Nos. 1, 2, 3, 4, 5, and 6 left entries; also the rooms on the above-mentioned entries. The fan was running 60 revolutions per minute. I measured 26,400 cubic feet of air entering the mine per minute, and found the ventilation very good throughout the workings which I inspected. I found the workings of the mine in good condition.

June 27, 1898.—On this date I continued my inspection of the Blossburg mine. I inspected Nos. 5, 6, 7, 8, 9, and 10 right entries and the main entry. I took air measurements throughout the workings above mentioned and found the workings well ventilated. Also found the workings in good condition.

The above report on the Blossburg mine includes No. 4 and No. 6 mines, which are on the same vein and operated by the same company.

DESCRIPTION OF THE PROPERTY OF THE RATON COAL AND COKE COMPANY, INCLUDING THE NEW ELECTRIC PLANT.

Lands.—There are 10,000 acres of coal land embraced in the property of the company, in which there are several seams of coal. At present, however, only one seam is being worked by two mines, Nos. 4 and 6, both of which are drift mines located close to each other, the coal averaging from 6 to 7 feet in thickness. The mines are dry and comparatively free from gas. The coal is an excellent quality of bituminous coal, and is used quite largely in New Mexico and Arizona for steam purposes and also in the manufacture of coke.

Coke ovens.—There are at present 76 beehive coke ovens of standard size, 13 feet in diameter. There is a peculiar feature in connection with the ovens, which is quite an innovation in the West, and that is the use of a hot-air flue located between the ovens which are double row batteries, and which flue enables us to economize and utilize the waste heat for generating steam. The waste heat is conducted by means of this flue and smokestacks on the boiler to the boiler plant midway between the two batteries of ovens, and generates a large proportion of the steam power required for the operation of our electric plant. This system of utilizing the waste heat is quite largely used in the South, especially in Alabama, but only one other plant of the beehive pattern with hot-air flue being in use in the United States outside of those in Alabama and New Mexico, this being in Pennsylvania.

Power.—The mines are equipped with three generators, aggregating 500 horsepower, using a 500-volt current. The plant is of the latest improved type, modern in every respect.

Mining.—Mining is done by a plant of 8 Morgan-Gardiner electric mining machines undercutting the coal 7 feet in depth and 44 inches wide, 4 inches high; time required is about four and one-half minutes. Hauling from the partings in the mine is done by 3 electric locomotives, which are in very successful operation, economizing cost of production and facilitating a ready increase of output at all times.

Washing plant.—Washing plant consists of two 400 tons capacity each Robinson-Wiggs coal washers, with all of the latest improved appliances for washing and handling 800 tons of coal per day. At present only 1 washer is used, the other being held in reserve for future increase in coke ovens. The trolley line for the hauling system is of No. 2/o hard-drawn copper. There is now about 9,000 feet of trolley line in use, 3,000 feet of which runs from the mouth of the mine to the tippie. All partings along the hauling system inside of the mine are furnished with electric lights. The line material was all furnished by the Ohio Brass Company, of Mansfield, Ohio. All the machinery, large and small, is driven by electric motors.

Tippie.—The tippie is of the latest improved construction, using automatic dumping apparatus and other minor appliances, and enables the company to handle the output, if required, of 2,000 tons per day.

Ventilation.—The mines are ventilated at present by one 25-foot diameter Guibal mine fan, and the mine also has a 22-foot Guibal fan, driven by electric motor, which we have in process of erection as a reserve, so that the mine will at all times be provided with ample ventilating capacity.

Machine shop.—A large machine shop, with modern tools, has been erected for the purpose of manufacturing and repairing all the machinery on the property.

Houses.—The company has 134 dwelling houses, all new, and erected during the past year.

Store.—A large brick store, one and one-half stories, 75 by 120 feet, which is well supplied with merchandise, has also been erected during the past year.

Accidents.—The most modern system of mining is used throughout the mines, and great care is taken to prevent accidents, which are remarkably few in comparison to output and number of men employed, especial attention being given to avoiding accidents to employees.

Summary.—The property now being operated is thoroughly modern and up to date—the most complete plant of its kind in the West. All labor-saving appliances and devices have been introduced, which are now in successful operation at the plant, that are now known in the mining trade.

SMITH MINE, No. 2.

[Henry Smith, lessee and general manager.]

This mine is located 1 mile north of the town of Raton, Colfax County, N. Mex. Owned by the Maxwell Land Grant Company and is operated under lease by Henry Smith. Kind of coal, bituminous; thickness of vein, 4 feet; total output, fiscal year, 2,972 tons; estimated value of output this year, \$5,201; length of drift, 300 feet; value of improvements this year, \$150; average number of men employed inside, 6; average number of boys employed inside, 2; where coal is marketed, town of Raton, N. Mex.; number of days mine worked, 240.

The product of this mine is hauled to the town of Raton, N. Mex., and retailed to the domestic trade. Capacity is about 10 tons per day. This mine is now ventilated by a furnace.

RECORD OF INSPECTION.

October 6, 1897.—On this date I inspected the Smith mine No. 2. I measured 2,160 cubic feet of air entering the mine per minute, and measured 2,340 cubic feet of air returning. I found the workings of the mine in good condition, and found the ventilation good throughout the workings of the mine.

December 11, 1897.—I again inspected the Smith mine No. 2. I found the workings of the mine in fair condition. At the time of my visit there were only four miners employed in the mine.

February 8, 1898.—On this date I again inspected the Smith mine No. 2. I measured 1,960 cubic feet of air entering the mine per minute. I found that the miners were working too far in advance of the air in Nos. 1, 2, and 3 rooms, and ordered crosscuts driven at the face of the rooms so as to force the air up to the face of the workings. The work of driving the crosscuts was commenced, and when completed the ventilation will be good throughout the workings.

March 23, 1898.—I again inspected the Smith mine No. 2. I measured 1,800 cubic feet of air entering the mine per minute, and measured 1,950 cubic feet of air returning. I found the ventilation good throughout the workings of the mine. I found the mine in good condition.

April 19, 1898.—I again inspected the Smith mine No. 2. I measured 2,100 cubic feet of air entering the mine per minute, and measured 2,275 cubic feet of air returning. I found the workings of the mine in good condition.

June 23, 1898.—On this date I again inspected the Smith mine No. 2. I measured 2,400 cubic feet of air entering the mine per minute, and measured 2,560 cubic feet of air returning through the return air course. On this visit I found the mine well ventilated and the workings in good condition.

MESA MINE.

[Thomas Griffiths, general manager.]

This mine is located about 7 miles east of Raton, Colfax County, N. Mex. Operated by Thomas Griffiths. Kind of coal, bituminous; thickness of vein, 5 feet; total output, fiscal year, 1,000 tons; estimated value of output, \$1,750; average number of employees inside, 3; average number of employees outside, 2; length of drift, 200 feet; total value of improvements this year, \$1,000; mine in operation, 200 days.

The product of this mine is hauled to Raton, N. Mex., and retailed to the domestic trade. Capacity, about 10 tons per day. Ventilation, natural.

RECORD OF INSPECTION.

October 11, 1897.—On this date I inspected the Mesa mine. I measured 1,750 cubic feet of air entering the mine per minute. I measured 1,800 cubic feet of air returning. I found the air distributed in compliance with the law. On this date only 2 miners were employed in the mine.

February 14, 1898.—I again inspected the mine known as the Mesa mine. I inspected the underground workings of the mine and found the same in good condition. At the time of my visit to the mine only 4 miners were employed therein.

March 29, 1898.—I again inspected the Mesa mine. At the time of my visit there were only 3 miners employed in the mine. I found the workings of the mine in fair condition.

June 28, 1898.—I again inspected the Mesa mine. I measured 1,400 cubic feet of air entering the mine per minute, and measured 1,575 cubic feet of air returning through the return air course. I found the ventilation good throughout the workings of the mine and found the mine in good condition.

MONERO MINE.

[J. H. Crist, owner and general manager.]

This mine is located at Monero, Rio Arriba County, N. Mex., on the Denver and Rio Grande Railroad. Kind of coal, bituminous; thickness of veins, three in number, 3 feet 10 inches, 3 feet 8 inches, 3 feet 6 inches; total output fiscal year, 22,500 tons; estimated value of output, \$31,000; depth of slopes, mine No. 1, 1,700 feet; mine No. 2, 550 feet; No. 3, 500 feet; value of improvements this year, \$4,000; average number of men employed outside, 13; average number of men employed inside, 32; where coal is marketed, Northern New Mexico and Colorado; number of days mines worked, 313.

The Rio Arriba Coal Company now owns and operates the three mines at Monero, and are designated as No. 1, No. 2, and No. 3 mine. Formerly No. 2 mine was owned by A. H. Willis, and No. 3 mine was owned by M. F. Simers.

RECORD OF INSPECTION.

October 27, 1897.—On this date I inspected the mine known as Monero mine. I measured 13,440 cubic feet of air entering the mine per minute, and measured 13,600 cubic feet of air per minute returning through the return air course. I found the miners in Nos. 2 and 3 right rooms working too far ahead of the air, and ordered crosscuts driven at the face of the rooms so as to give the air a chance to circulate up to the face of the workings; otherwise I found the mine in fair condition.

October 28, 1897.—On this date I inspected No. 2 slope of the Monero mine. I measured 6,000 cubic feet of air entering the slope per minute. At the time of my visit the only work being done in this mine was the driving of the slope. I found the workings in fair condition. I found that the cars were being hoisted out of the slope without using an iron drag, and ordered the superintendent to have a drag attached to the last car on every trip of cars hoisted out of the mine. This drag is attached for the purpose of derailing the cars should the rope break.

COOK & WHITE MINE.

[James Duggan, superintendent; William Brown, pit boss.]

This mine is located 3 miles south of the town of Cerrillos, Santa Fe County, N. Mex. Owned and operated by the Cerrillos Coal Railroad Company. Kind of coal, bituminous; thickness of vein, 3 feet 6 inches; total output fiscal year, 115,000 tons; estimated value of output, \$172,500; value of improvements this year, \$5,000; average number of men employed outside, 25; average number of men employed inside, 250; average number of boys employed inside, 10; where coal is marketed, New Mexico, Arizona, California, Old Mexico, and Texas; number of days mine worked, 278.

This mine is situated on a branch of the Atchison, Topeka and Santa Fe Railroad, which connects with the main line at Waldo Station. The product of the mine is sold to the Atchison, Topeka and Santa Fe Railroad, California, Texas, and Old Mexico, and has a capacity of 700 tons per day. This mine is ventilated by two fans.

RECORD OF INSPECTION.

September 8, 1897.—On this date I inspected the Cook & White mine. I measured 27,000 cubic feet of air entering the mine per minute, and measured 30,405 cubic feet of air returning through the return air course. I then took air measurements throughout the workings of the mine and found the air distributed as follows:

	Cubic feet air.
Last crosscut, first left entry	8,610
First left room in first left dip plane.....	2,840
Second left room in first left dip plane.....	3,000
No. 4 room on right of first left dip plane.....	630
No. 3 room on right of first left dip plane.....	2,400
No. 2 room on right of first left dip plane.....	8,450

	Cubic feet air.
Last crosscut between first left air course and No. 1 right room on left dip plane.....	12,600
Main return above No. 2 left entry.....	11,900
Face of second left main entry.....	7,600
Last crosscut No. 2 left entry.....	14,800
Face of No. 2 left back entry.....	6,720
Last return on left of No. 2 slope.....	12,250
Bottom of slope.....	8,800
Last return on right of No. 2 slope.....	11,560
Above lower splits, near bottom of slope.....	25,850
Last crosscut between front and back entry on second right.....	11,700
Last crosscut between first right back entry and first left room on first right dip plane.....	13,200
Last crosscut between second and third left rooms on right dip plane.....	10,125
Last crosscut between third and fourth left rooms on right dip plane.....	9,360
Last crosscut between fourth and fifth left rooms on right dip plane.....	7,245
Last crosscut between fifth and sixth left rooms on right dip plane.....	8,660
Last crosscut between sixth and seventh left rooms on right dip plane.....	6,660
Return air at bottom of right dip plane.....	2,475
Face of No. 8 right room, right dip plane.....	2,750
Last crosscut between Nos. 6 and 7 right rooms.....	7,770
Last crosscut between Nos. 5 and 6 right rooms.....	8,750
Last crosscut between Nos. 4 and 5 right rooms.....	7,000
Last crosscut between Nos. 3 and 4 right rooms.....	6,300
Last crosscut between Nos. 2 and 3 right rooms.....	9,900
First right entry at face of workings.....	2,240
Last crosscut, first right, between front and back entry.....	6,825
Return at No. 3 fan.....	18,720
Return at No. 1 fan.....	11,685

I found the workings of the mine well timbered and in good condition.

October 14, 1897.—On this date I again inspected the Cook & White mine and took air measurements, and found the measurements to be as follows:

	Cubic feet air.
Intake.....	30,000
Return at No. 1 fan.....	14,760
Last crosscut between Nos. 1 and 2 left rooms on left dip plane.....	5,120
Face of No. 3 left room.....	5,000
Last crosscut between Nos. 3 and 4 left rooms.....	8,750
Last crosscut between Nos. 4 and 5 left rooms.....	6,600
Last crosscut between Nos. 5 and 6 left rooms.....	9,100
Bottom of left dip plane.....	3,000
Last crosscut between Nos. 1 and 2 right rooms on left dip plane.....	12,700
Last crosscut between Nos. 2 and 3 right rooms.....	8,400
Last crosscut between Nos. 3 and 4 right rooms.....	6,000
Last crosscut between Nos. 4 and 5 right rooms.....	8,775
Last crosscut between Nos. 5 and 6 right rooms.....	7,995
Face of second left main entry.....	6,600
Last crosscut on second left entry between front and back entry.....	9,000
Face of second left entry.....	10,200
Slope above lower splits.....	29,700
Last return on left side of slope.....	12,045
Bottom of slope.....	6,975
Last return on right of slope.....	10,500

October 15, 1897.—On this date I continued my inspection of the Cook & White mine and took air measurements throughout the workings as follows:

	Cubic feet air.
Face of second right entry.....	720
Last crosscut between front and back entry.....	8,550
Face of second right back entry.....	4,042½
Bottom of right dip plane.....	10,125
Last crosscut between Nos. 2 and 3 right rooms, right dip plane.....	4,050
Last crosscut between Nos. 3 and 4 right rooms.....	3,150
Last crosscut between Nos. 4 and 5 right rooms.....	6,270
Last crosscut between Nos. 5 and 6 right rooms.....	5,800
Last crosscut between Nos. 6 and 7 right rooms.....	7,400
Last crosscut between Nos. 7 and 8 right rooms.....	2,700
Last crosscut near face of first right entry.....	4,800

	Cubic feet air.
Last crosscut between first right main and No. 1 left room on second raised plane.....	5,600
Last crosscut between Nos. 1 and 2 left rooms	3,960
Top of second raised plane	2,160
Return at No. 3 fan	18,240

I found the workings of the mine well timbered and in good condition.

November 23, 1897.—I again inspected the Cook & White mine. I measured 39,250 cubic feet of air entering the mine per minute and took air measurements throughout the workings of the mine and found the air distributed as follows:

	Cubic feet air.
Above lower air splits in slope.....	35,750
Left return near bottom of slope	15,600
Right return near bottom of slope	18,300
Face of No. 3 left entry	2,628
Last crosscut at bottom of slope to back slope.....	2,100
Face of second right back entry	5,880
Last crosscut between No. 2 front and back entry	12,150
Face of No. 2 right main entry	3,120
Last crosscut between Nos. 4 and 5 right rooms, right dip plane	12,920
Last crosscut between Nos. 8 and 9 right rooms.....	9,135
Last crosscut between Nos. 9 and 10 right rooms.....	6,600

November 24, 1897.—I continued my inspection of the Cook & White mine and took air measurements throughout the workings as follows:

	Cubic feet air.
Last crosscut first left entry.....	9,800
Last crosscut between Nos. 2 and 3 rooms, left dip plane.....	10,600
Bottom of left dip plane	2,100
Crosscut between Nos. 1 and 2 rooms	5,800
Air course, first right back entry	16,560
Face of first right entry.....	3,150
Last crosscut between front and back entry, first right	14,760
Last crosscut between first right entry and No. 1 left room on plane.....	1,368
Last crosscut between Nos. 3 and 4 left rooms on second raised plane.....	7,200
Top of No. 2 raised plane	2,400
Face of second left main entry	3,960
Last crosscut, second left main entry	7,940
Face of second left back entry	4,675
Face of No. 1 raised plane	3,744
Return at No. 3 fan	21,700
Return at No. 1 fan	14,350
Intake, this date.....	35,000

I found the workings of the mine in good condition.

December 16, 1897.—I again inspected the Cook & White mine. I measured 44,000 cubic feet of air entering the mine per minute, and measured 37,400 cubic feet of air traveling above the lower air splits on the slope.

	Cubic feet air.
Left return near bottom of slope	11,395
Right return near bottom of slope	18,200
Bottom of slope.....	11,500

I found the air distributed throughout the workings in compliance with the law, and found the workings in good condition.

December 17, 1897.—I continued my inspection of the Cook & White mine. I found the miners working too far in advance of the air in the second left entry and ordered a crosscut driven between the main back entry, so as to force the air up to the face of the workings. In all other working places in the mine I found the ventilation good. The crosscut was commenced, and as soon as completed I would consider the mine in good condition.

January 21, 1898.—On this date I inspected the machinery of the Cook & White mine and found the machinery in good condition.

January 22, 1898.—I inspected the workings of the Cook & White mine which are located on the left side of the main slope and took air measurements, which I found to be as follows:

	Cubic feet air.
Intake.....	41,750
Return on left side at No. 1 fan	20,000
Last crosscut near face of first left entry	15,345

	Cubic feet air.
Last crosscut between Nos. 1 and 2 left rooms, first left dip plane.....	4, 800
Last crosscut between Nos. 2 and 3 left rooms.....	3, 500
Last crosscut between Nos. 7 and 8 right rooms.....	8, 800
Last crosscut between Nos. 9 and 10 right rooms.....	6, 600
Last crosscut between Nos. 5 and 6 left rooms.....	4, 000
Last crosscut on second left main entry.....	5, 250
Face of second left back entry.....	6, 100
Face of second left main entry.....	5, 125
Above lower air splits.....	38, 500
Left return on main slope, near bottom of slope.....	12, 540
Bottom of slope.....	5, 580
Face of lowest crosscut on main to back slope.....	3, 840
Right return on main slope, near bottom.....	19, 760

January 24, 1898.—I continued my inspection of the Cook & White mine and took air measurements on the right side of the slope, as follows:

	Cubic feet air.
Last crosscut on second right entry.....	15, 200
Face of second right back entry.....	3, 465
Face of second right main entry.....	6, 240
Face of No. 11 left toom, first right dip plane.....	3, 120
Crosscut between Nos. 10 and 11 left rooms.....	10, 320
Face of No. 10 left room.....	3, 600
Crosscut between—	
10 and 11 right rooms, first right dip plane.....	10, 220
9 and 10 right rooms, first right dip plane.....	4, 810
8 and 9 right rooms, first right dip plane.....	11, 880
7 and 8 right rooms, first right dip plane.....	11, 900
6 and 7 right rooms, first right dip plane.....	13, 750
5 and 6 right rooms, first right dip plane.....	11, 900
4 and 5 right rooms, first right dip plane.....	2, 860
Face of first right main entrance.....	1, 875
Last slant between first right front and back entries.....	12, 000
Last crosscut between first left raised plane and first right entry.....	9, 000
Crosscut between—	
Nos. 1 and 2 left rooms, second raised plane.....	7, 830
Nos. 2 and 3 left rooms, second raised plane.....	8, 640
Nos. 3 and 4 left rooms, second raised plane.....	5, 580
Nos. 4 and 5 left rooms, second raised plane.....	5, 400
Nos. 5 and 6 left rooms, second raised plane.....	4, 350
Nos. 6 and 7 left rooms, second raised plane.....	2, 240
Face of No. 8 left room, second raised plane.....	800
Crosscut between—	
Nos. 6 and 7 right rooms, second raised plane.....	2, 240
Nos. 4 and 5 right rooms, second raised plane.....	1, 400
Return to No. 3 fan.....	28, 800
Main intake on this date.....	43, 500

I found the workings of the mine to be well ventilated and found some carburated hydrogen gas at the face of the second right back entry and ordered a crosscut driven between the front and back entries. The crosscut was commenced at once.

January 26, 1898.—On this date the miners who were working in the second left entry of the Cook & White mine reported the finding of some carburated hydrogen gas at the face of the entry. I immediately went down the mine into where the gas was reported and found some gas generating at the face of the entry. I ordered the canvas brattices extended up to the face of the workings, and ordered a crosscut driven from the face of the main entry to the back entry, and ordered the last crosscut bratticed up, so as to force all the air to the face of the workings. After this work had been completed the gas disappeared.

January 29, 1898.—On this date I was informed that the crosscuts in the second right and second left entries of the Cook & White mine had been completed. I again went down into the mine and found that the crosscuts had been driven according to my orders of the 24th and 26th.

I measured 9,470 cubic feet of air traveling at the face of the second left entry and found very little gas in the entry. I measured 16,920 cubic feet of air traveling in the crosscut at the face of the second right entry and found no gas in the front or back entries. I ordered the superintendent to allow nothing but safety lamps to be used in places where the slightest particle of carburated hydrogen gas was known to exist.

February 17, 1898.—I again inspected the underground workings of the Cook & White mine. I measured 35,000 cubic feet of air entering the mine per minute and took air measurements throughout the workings, which were as follows, viz:

	Cubic feet air.
Last crosscut between first left main and back entry	8,000
Face of second left main entry	4,085
Last crosscut between second left, main, and back entry	4,860
Face of second left back entry	2,880
Second left air course, outside of No. 1 slant	7,700
Second left back entry, outside of No. 2 slant	9,890
Above air splits near bottom of slope	33,000
Bottom of slope	14,400
Last return on right of slope	15,750
Last return on left of slope	11,400
Face of second right entry	6,130
Crosscut, second right entry	14,630
Face of second right back entry	4,250

February 18, 1898.—On this date I continued my inspection of the Cook & White mine and inspected the workings on the right side of the main slope; also inspected the bottom of the slope. I found a small amount of carbureted hydrogen gas at the bottom of the slope and ordered the canvas brattice extended up to the face of the workings. I then took air measurements as follows:

	Cubic feet air.
Last crosscut between first right main and back entry	9,230
Face of first right main entry	4,970
Face of first right back entry	6,840
Last crosscut between No. 1 left room and first right main entry	9,360
Last crosscut between Nos. 1 and 2 left rooms, on No. 1 raised plane	8,000
Last crosscut between Nos. 2 and 3 left rooms	7,525
Face of No. 1 raised plane	2,500
Last crosscut between Nos. 7 and 8 left rooms	4,100
Last crosscut between Nos. 6 and 7 right rooms	1,120
Return at No. 3 fan	27,000
Return at No. 1 fan	16,800

I found the workings of the mine to be well ventilated and found the mine in fair working condition.

March 15, 1898.—I inspected the hoisting machinery, fans, ropes, and boilers belonging to the Cook & White mine, and found the machinery in good condition.

March 16, 1898.—On this date I again inspected the workings on the left side of the slope of the Cook & White mine. Also the bottom of the slope and the second right entries. I measured 39,750 cubic feet of air entering the mine per minute. I measured 18,000 cubic feet of air traveling at the bottom of the slope. I discovered a small amount of carbureted hydrogen gas in No. 3 right entry, which had been started near the bottom of the slope, and I ordered the canvas brattice extended up to the face of the workings of said entry.

March 17, 1898.—I continued my inspection of the Cook & White mine. I inspected No. 1 right entries, also the rooms on No. 2 right raised plane. I found the workings which I inspected in good condition and found the ventilation good throughout the workings.

March 18, 1898.—I again inspected the workings at the bottom of the slope and No. 3 right entry. I found that the canvas brattice had been extended up to the face of the workings of No. 3 right entry according to my instructions of March 16, and found that the gas had disappeared from the entry. I then inspected No. 1 right entries, also the rooms on No. 2 right raised plane. I found the places above mentioned in good condition and found the ventilation good throughout the workings.

April 11, 1898.—On this date I inspected all of the safety lamps which were being used in the Cook & White mine. I found the lamps in good condition.

April 13, 1898.—I inspected the Cook & White mine. I measured 40,000 cubic feet of air entering the mine per minute and measured 34,100 cubic feet of air traveling at the bottom of the slope. I found a small quantity of gas at the bottom of the slope, also at the face of the third right entry, and had the canvas brattice extended up to the face of the workings and removed the gas. I also inspected the main air courses and found them in good condition.

April 14, 1898.—I continued my inspection of the Cook & White mine. I inspected the rooms of Nos. 1 and 2 raised planes and found them well ventilated. Found the workings well timbered and in good condition.

April 15, 1898.—On this date I inspected No. 1 left dip plane of the Cook & White mine and the rooms thereon. I found the ventilation good throughout the workings and found the rooms well timbered and in fair condition.

April 16, 1898.—On this date I inspected the rope which is used for hoisting the loaded cars out of the Cook & White mine. I found the rope in bad condition, being much worn in one place. I called the superintendent's attention to the rope, and he informed me that he would have the rope attended to on Sunday when the mine was not being operated.

June 14, 1898.—I again inspected the machinery of the Cook & White mine and found that nothing had been done with main hauling rope on the Cook & White mine and ordered the superintendent to replace the old rope with a new one as soon as possible. The superintendent informed me that a new rope had been ordered and would be put in place just as soon as it arrived, and on Sunday, 18th, the new rope was put in place.

June 15, 1898.—On this date I commenced the inspection of the underground workings of the Cook & White mine, and while inspecting the mine, about 9 o'clock a. m. a miner informed me that a fire had been discovered in room No. 9 on the first right dip plane. I immediately went down the dip plane to where the fire was reported, and after looking the situation over had a force of men put to work extending the pipeline from the main pipe line to the place where the fire had occurred. After the pipe line had been extended I caused a hose to be attached to the pipe line. I then had the pump started, and with a force of men commenced the work of extinguishing the fire. A force of men were also employed to work all night and hold the fire in check. On the morning of the 16th I again visited the place where the fire was and found that very little progress had been made in extinguishing the fire, and found it a very difficult matter to handle. I worked all this day with men in trying to extinguish the fire. I also had a force of men ordered to work all that night and keep a constant stream of water on the fire. On the morning of the 17th I again visited the place where the fire had originated and found that the fire had been almost extinguished and wholly under control, and at about 2 p. m. no signs of fire could be seen. I then ordered that all debris in rooms 9 and 10 be loaded into pit cars and hauled out of the mine. This work was commenced at once.

June 18, 1898.—On this date I inspected the underground workings of the Cook & White mine and took air measurements. The air measurements on this date were as follows:

	Cubic feet air.
Intake.....	40,000
No. 1 right entry.....	10,800
Crosscut, second raised plane.....	9,360
No. 3 left room, No. 2 raised plane.....	6,840
No. 5 left room, No. 2 raised plane.....	5,775
No. 7 left room, No. 2 raised plane.....	3,360
First raised plane on second right entry.....	6,300
Last crosscut, face of second right entry.....	8,980
Third left entry, near bottom of slope.....	3,920
Right back slope.....	21,440
Left back slope.....	8,500
Above air splits near bottom of slope.....	26,000
Back air course, second left entry.....	7,800
Last crosscut between front and back entries, second left entry.....	4,350
Bottom of second left raised plane.....	3,000
Return at No. 1 fan.....	18,000
Return at No. 3 fan.....	24,000

I found the ventilation good throughout the workings of the mine, and found the mine in fair working condition.

June 22, 1898.—On this date I was informed by a miner that considerable gas had accumulated in rooms 9 and 10 on the first right dip plane where the fire had originated. I immediately visited the above-mentioned rooms and found considerable gas in room No. 9. I measured the air which was traveling between rooms 9 and 10 and found only 750 cubic feet of air traveling per minute, which was not sufficient to sweep the gas away. The air course was very small and I ordered the air course enlarged so that a sufficient quantity of air could travel through the air course and sweep the gas away and render it harmless. The work of enlarging the air course was commenced at once, and before the miners came out in the evening the gas had all disappeared.

This mine generates considerable carburated hydrogen gas, but the superintendent uses every precaution to avoid accidents happening in the mine, and everything possible is done to protect the lives of the miners.

WHITE ASH MINE.

[James Duggan, superintendent; William Graham, pit boss.]

This mine is located about $2\frac{1}{2}$ miles south of the town of Los Cerrillos, Santa Fe County, N. Mex. Owned and operated by the Cerrillos Coal Railroad Company. Kind of coal, bituminous; thickness of vein, 5 feet 6 inches; total output, fiscal year, 108,000 tons; estimated value of output, \$182,000; value of improvements this year, not given; average number of men employed outside, 23; average number of men employed inside, 100; average number of boys employed, 4; where coal is marketed, New Mexico, Arizona, Mexico, and Texas; number of days mine worked, 278.

This mine is situated on a branch line of the Atchison, Topeka and Santa Fe Railroad, which connects with the main line at Waldo Station. Capacity, about 400 tons per day. This mine is ventilated by a 15-foot Guible fan. All the pillars in this mine have been drawn to within 500 feet of the surface, and the probabilities are that the mine will be worked out within six months and closed down.

RECORD OF INSPECTION.

September 9, 1897.—On this date I inspected the underground workings of the White Ash mine. The fan was running 90 revolutions per minute, and I measured 36,960 cubic feet of air entering the mine per minute, and measured 40,000 cubic feet of air returning through the return air course. I then took air measurements throughout the workings of the mine and found the air distributed as follows:

	Cubic feet air.
Bottom of slope.....	22,200
Back slope.....	6,090
Right side of slope.....	10,760
Between third and fourth left entries.....	14,040
Between second and third left entries.....	11,160
Between first and second left entries.....	20,000
Bridge overcast, return from left side of slope.....	21,300

I found the workings of the mine in good condition, and found the mine well ventilated.

October 16, 1897.—I again inspected the White Ash mine. I measured 38,550 cubic feet of air entering the mine per minute, and measured 41,200 cubic feet of air returning. I found the air distributed throughout the workings as follows:

	Cubic feet air.
Face of second left entry.....	20,000
Face of third left entry.....	12,420
Face of third right entry.....	9,600
Bottom of slope.....	25,200
Back slope.....	9,240
Bridge overcast, air from left side of slope.....	23,700

I ordered the pit boss to keep the miners well supplied with props, in order to secure their working places, as the only work being done in this mine is the drawing of pillars.

November 22, 1897.—I again inspected the White Ash mine. The fan was running 80 revolutions per minute, and I measured 30,120 cubic feet of air entering the mine per minute, and measured 31,000 cubic feet of air returning. I found the ventilation good, and found the workings of the mine in fair condition.

December 15, 1897.—I again inspected the White Ash mine. The fan was running 80 revolutions per minute, and I measured 31,360 cubic feet of air entering the mine per minute, and measured 31,500 cubic feet of air returning. I found some timbers broken in the second left entry and ordered new timbers put in. I also ordered the miners to keep drill holes 12 feet in length ahead of any new workings in the mine. This was done in order to keep from breaking through into old workings which are supposed to have been made in the mine several years ago, and are supposed to have large bodies of water therein.

December 21, 1897.—On this date I again visited the White Ash mine to ascertain if the miners were keeping drill holes ahead of the new work, according to my orders of December 15. I found the miners obeying my orders, and found two company men working with a diamond drill so as to keep holes drilled from 50 to 100 feet in advance of any new workings.

January 21, 1898.—On this date I inspected the machinery of the White Ash mine. I found the water in the boilers very dirty, and ordered the boilers to be blown off and cleaned as soon as possible. I was informed that the work would be done on Sunday when the mine was not working. The work was performed.

January 25, 1898.—On this date I again inspected the underground workings of the White Ash mine and took air measurements. The fan was running 83 revolu-

tions per minute, and I measured 41,860 cubic feet of air entering the mine per minute, and measured 49,600 cubic feet of air returning through the return air course. I found the workings of the mine well ventilated and found the mine in good condition.

February 16, 1898.—I again inspected the underground workings of the White Ash mine. The fan was running 30 revolutions per minute, and I measured 38,400 cubic feet of air entering the mine per minute, and measured 43,875 cubic feet of air returning through the return air course. I found the workings of the mine well ventilated and found the mine in good condition.

March 15, 1898.—On this date I inspected the hoisting machinery, fans, ropes, and boilers belonging to the White Ash mine and found the same in good condition.

March 19, 1898.—On this date I again inspected the White Ash mine. The fan was running 82 revolutions per minute, and I measured 28,000 cubic feet of air entering the mine per minute. I then took air measurements throughout the workings of the mine and found a sufficient quantity of air traveling in the working places to comply with the law. I found a small quantity of carbureted hydrogen gas at the face of the entry known as the left dip entry, and had the brattice extended up to the face of the entry. After this was done the gas soon moved from the face of the entry and I considered the mine in good condition.

April 12, 1898.—I again inspected the underground workings of the White Ash mine. The fan was running 83 revolutions per minute, and I measured 41,560 cubic feet of air entering the mine per minute, and measured 42,240 cubic feet of air returning per minute. I found the ventilation very good throughout the workings of the mine, and found the workings of the mine in good condition.

June 14, 1898.—I again inspected the machinery of the White Ash mine and found the same in good condition.

June 20, 1898.—I again inspected the White Ash mine. The fan was running 83 revolutions per minute, and I measured 35,530 cubic feet of air entering the mine per minute, and measured 36,840 cubic feet of air returning through the return air course. I found the air distributed throughout the workings in accordance with the law and found the workings in good condition.

LUCAS MINE.

[James Duggan, superintendent; William Brown, pit boss.]

Located 3 miles south of the town of Los Cerrillos, Santa Fe County, N. Mex. Owned and operated by the Cerrillos Coal Railroad Company. Kind of coal, anthracite; thickness of vein, 3 feet 9 inches; total output fiscal year, 25,000 tons; estimated value of output, at mine, \$100,000; depth of slope, 1,200 feet; value of improvements this year, not given; average number of men employed outside, 40; average number of men employed inside, 100; average number of boys employed inside, 2; where coal is marketed, New Mexico, Arizona, California, Colorado, and Kansas; number of days mine worked, 177.

This mine is located on a branch of the Atchison, Topeka and Santa Fe Railroad, which connects with the main line of the road at Waldo Station, and has a capacity of about 450 tons per day. The mine is ventilated by a double 6-foot Murphey fan.

RECORD OF INSPECTION.

September 11, 1897.—On this date I inspected the Lucas mine. At the time of my visit to the mine it was not being operated. I inspected the underground workings and found them in good condition.

October 18, 1897.—I inspected the workings of the Lucas mine, which are located on the left side of the main slope. The only work being done on the left side of the mine was the drawing of pillars. I found the workings in fair condition.

October 19, 1897.—On this date I continued my inspection of the Lucas mine and took air measurements. I measured 15,800 cubic feet of air entering the mine per minute, and measured 16,800 cubic feet of air per minute, returning through the return air course. I found the mine well ventilated and found the workings well timbered and in good condition.

October 20, 1897.—On this date I inspected the old workings of the Lucas mine and found no gas (fire damp) in the old, abandoned workings and found the air courses in good condition.

November 26, 1897.—On this date I again inspected the Lucas mine. The fan was running 140 revolutions per minute, and I measured 11,000 cubic feet of air entering the mine per minute, and measured 12,250 cubic feet of air returning through the return air course. I found the air distributed in compliance with the law and found the workings of the mine in fair condition.

November 29, 1897.—On this date I inspected the machinery of the Lucas mine. I found that the fan was being run at 110 revolutions per minute, its regular speed being 150 revolutions, and I ordered the fan speeded up to 150 revolutions per minute.

December 18, 1897.—I again inspected the Lucas mine. The fan was running 180 revolutions per minute, and I measured 15,920 cubic feet of air per minute entering the mine, and measured 16,450 cubic feet of air returning through the return air course. I measured 7,875 cubic feet of air traveling at the bottom of the slope.

	Cubic feet air.
Last crosscut in fourth right entry.....	1,920
Last crosscut in third right entry.....	2,400
Last crosscut, second left right entry.....	3,520

I found the mine in fair working condition.

January 27, 1898.—On this date I inspected the main hauling slope and Nos. 2, 3, and 4 right entries of the Lucas mine. I measured 16,800 cubic feet of air entering the mine per minute and measured 18,275 cubic feet of air returning. I found the air distributed throughout the workings of the mine in compliance with the law, and found the mine in good condition.

January 28, 1898.—I continued my inspection of the Lucas mine. I inspected No. 1 right entry, and found the entry in good condition. I also inspected the hoisting engine, boilers, and ropes belonging to the Lucas mine, and found the same in good condition.

March 21, 1898.—I again inspected the Lucas mine. The mine was not being operated on this date, but I examined the air courses and main entries, and found the same in good condition. I also found the machinery in good condition.

June 21, 1898.—I again inspected the Lucas mine. I measured 9,130 cubic feet of air entering the mine per minute. I then measured the air just below the fourth right entry, and found only 3,150 cubic feet of air traveling per minute. I ordered that all stoppings along the slope be made air-tight, so as to conduct more air into the fourth right entry. At the time of my visit to the mine there were only 18 miners employed therein.

CARTHAGE MINE.

[Hilton & Luerra, operators.]

Located about 12 miles southeasterly direction from San Antonio, Socorro County, N. Mex. Kind of coal, soft bituminous; thickness of vein, 4 feet 6 inches; total output, fiscal year, 1,500 tons; estimated value of output, \$3,000; depth of slope, 2,200 feet; value of improvements this year, \$1,000; average number of men employed outside, 2; average number of men employed inside, 2; where coal is marketed, Socorro, San Marcial, Belen, and Magdalena, N. Mex.; number of days mine worked, 200.

The coal is hauled in wagons and shipped from San Antonio, N. Mex., to the different towns above mentioned along the Atchison, Topeka and Santa Fe Railroad. This mine has a capacity of about 50 tons per day, and is ventilated by an air shaft. There is considerable development work done on the mine, and the coal is of a very good character, but having to haul 12 miles in wagons is too great an expense to compete with other mines which are situated on lines of railroad.

RECORD OF INSPECTION.

September 27, 1897.—On this date I inspected what is known as the Carthage Coal Company mine. I measured 1,750 cubic feet of air entering the mine per minute, and measured 1,787½ cubic feet of air returning per minute through the outcast. I found the main entry had been driven too far without a crosscut, and ordered a crosscut driven from the face of the main entry to the main return air way. At the time of my visit the mine was not being operated, but Mr. Givani Luerra informed me that he expected to do considerable work during the winter months.

EMPLOYEES.

The following tabulated statement shows the number of miners, day men, and boys employed in and about the coal mines of the Territory:

County.	Miners.	Boys.	Day men.	Total.
Bernalillo.....	792	14	118	924
Colfax.....	209	.....	152	361
Elo Arriba.....	32	.....	13	45
Santa Fe.....	450	16	88	554
Socorro.....	2	.....	2	4
Total.....	1,485	30	373	1,888

In the column headed "Day men" are included all men employed in and around the mines in any capacity except those actually engaged in mining.

During the fiscal year 1897-98 the total number of employees as reported to me by the various mining companies was 1,888, an increase of employees of 523, as against the number employed in the previous year.

PRODUCTION OF COAL.

Name of mine.	Men employed.		Tons of coal mined.		Estimated value of product, 1897-98.
	1896-97.	1897-98.	1896-97.	1897-98.	
<i>Bernalillo County.</i>					
Beacon Hill				600	\$1,080
Caledonia	43		20,900		
Catalpa	7	68		4,356	8,000
Canavan & Bailey	10	8	3,100	800	1,200
Crown Point	165	156	42,333	61,194	92,000
Gallup	208	260	109,270	141,145	220,000
Otero	52	177	21,470	90,388	134,049
Rocky Cliff	33	85	15,500	22,000	33,000
Sunshine	49	125	53,364	48,480	80,000
W. A. Clark		80		3,500	4,000
Mulholland & Casna		6		200	400
Total	567	927	275,987	372,611	575,729
<i>Colfax County.</i>					
Blossburg	350	380	200,000	210,000	357,500
Mesa	5	5	1,300	1,000	1,750
Smith No. 2	7	8	2,067	2,972	5,201
Total	362	378	208,267	213,973	364,451
<i>Rio Arriba County.</i>					
Monero Nos. 1, 2, and 3	23	45	18,000	22,500	31,000
<i>Socorro County.</i>					
Carthage	2	4	1,224	1,500	3,000
<i>Santa Fe County.</i>					
Cook & White	100	285	98,500	115,000	172,500
Lucas	172	142	33,000	75,000	100,000
White Ash	97	127	98,900	108,000	162,000
Total	369	554	225,400	248,000	434,500

RECAPITULATION.

County.	Output for fiscal year.	Estimated value.	Percentage of output for Territory.
	<i>Tons.</i>		<i>Per cent.</i>
Bernillo	372,611	\$575,729	43.398
Colfax	213,972	364,451	24.922
Santa Fe	248,000	434,500	28.884
Rio Arriba	22,500	31,000	2.883
Socorro	1,500	3,000	.174
Total	858,583	1,408,680	100.000

Analysis of coal from the White Ash Mine of the Cerrillos Coal Railroad Company.

[Made by W. D. Church, December 2, 1896.]

COAL FROM MADRID, N. MEX., WHITE ASH MINE.

Water	per cent..	2.00
Volatile matter	do.....	39.00
Fixed carbon	do.....	53.76
Mineral ash	do.....	5.24
Total	do.....	100.00

Coke	per cent..	58.00
Character of coke, strong and tough.		
Color of ash, light yellowish gray.		
Character of ash, soft and light.		
Sulphur (as sulphide)	do....	.010
Sulphur (as sulphate)	do....	.022
Phosphorus	do....	.006
Specific gravity	do....	1.410
One cubic foot weighs	pounds..	88.125
Analysis of mineral ash:		
Silica	per cent..	26.93
Alumina	do....	32.41
Oxide of iron	do....	3.96
Calcium oxide	do....	24.68
Magnesium oxide	do....	10.32
Calcium sulphate	do....	.21
Alkalies, and loss	do....	1.49
Total	do....	100.00

COAL FROM RATON COAL AND COKE COMPANY.

Water	per cent..	.75
Volatile matter	do....	34.40
Fixed carbon	do....	56.93
Mineral ash	do....	7.92
Total	do....	100.00
Coke	do....	64.85
Character of coke, very strong and tough.		
Color of ash, very light ocher.		
Character of ash, soft and light.		
Sulphur (as sulphide)	do....	.016
Sulphur (as sulphate)	do....	.022
Phosphorus	do....	.014
Specific gravity	do....	1.291
One cubic foot weighs	pounds..	88.690
Analysis of mineral ash:		
Silica	per cent..	44.16
Alumina	do....	39.28
Oxide of iron	do....	2.95
Calcium oxide	do....	7.41
Magnesium oxide	do....	3.27
Sulphate of calcium	do....	.41
Alkalies, and loss	do....	2.52
Total	do....	100.00

From the column of percentages of production it will be seen that the output of coal from the Territory comes practically from four counties.

For the fiscal year ending June 30, 1898, there were reported 20 mines in operation, 4 less than during the previous year.

The production for the fiscal year 1897 and 1898 was 858,583 tons. This is an increase of production of 125,044 tons.

During the fiscal year there were reported to the mine inspector 7 fatal accidents, the causes of which were as follows: By falls of rock, 3; falls of coal, 2; runaway cars, 1; firing blast, 1.

The following table shows the number of tons of coal mined for each life lost:

County.	Tons mined.	Lives lost.	Tons of coal mined to each life lost.
Bernalillo	372,611	1	372,611
Colfax	213,972	1	213,972
Santa Fe	248,000	5	49,600

The nonfatal accidents reported to me as mine inspector during the fiscal year were as follows: By falls of rock, 8; pit cars, 4; unclassified, 2.

The following table shows the number of tons of coal mined to each nonfatal accident:

County.	Tons mined.	Accidents.	Tons of coal mined to each nonfatal accident.
Bernalillo	372, 611	4	93, 152.8
Colfax	213, 972	2	106, 986
Santa Fe	248, 000	8	31, 000

ACCIDENTS.

Table of accidents of a fatal character reported to the mine inspector for the fiscal year ending June 30, 1898.

Where accident occurred.	Date.	Name.	Character of injury.	Cause of death.
Blossburg mine, Blossburg, N. Mex.	Nov. 25, 1897	Wm. Sartoris	Skull crushed	Fall of coal.
Gallup mine, Gallup, N. Mex. . .	Mar. 3, 1898	Franz Dellazer ...	Fracture of part pubic bone.	Do.
Cook & White, Madrid, N. Mex.	Feb. 19, 1898	Bathisti Desidero.	Head completely mashed.	Do.
Do	Nov. 16, 1897	Benjamin Martinez.	Fractured base of skull.	Do.
Do	Mar. 26, 1898	Antonio Vignasa .	Skull crushed	Do.
Do	Apr. 8, 1898	John Foster	Fracture of six ribs penetrating lungs.	Struck by a piece of coal in firing shot.
White Ash mine, Madrid, N. Mex.	Dec. 5, 1897	J. H. Curley	Compound fracture of right leg and scalp wound.	Runaway car.

RECORD OF FATAL ACCIDENTS.

November 25, 1897.—At Blossburg mine, William Sartoris, a miner, an Italian, age 45 years, had his skull and face crushed, and died almost immediately. Cause: The deceased was at work mining coal (undercutting) when coal fell on him, crushing his skull and face, producing death in about one hour. Left wife and eight children. No coroner's jury.

March 3, 1898.—At Gallup mine, Franz Dellazer, Austrian, age 37 years, was injured by a fall of rock, which caused his death. Cause: The deceased had his room in good condition, but a small piece of rock, close up against the coal face in the nature of a pot and feathered edge slip, dropped out without any warning, striking him, causing a fracture of the pubic bone, with internal injuries caused by part of the bone penetrating the intestines, also probable rupture of bladder. The deceased lived about seven hours after receiving the above injuries. No coroner's jury.

February 19, 1898.—At Cook & White mine, Bathisti Desidero, an Italian, age 35 years, had his head completely mashed, and died immediately. Cause: Fall of rock at face of his room. Number in family: Wife and two children. No coroner's jury.

November 16, 1897.—At the Cook & White mine, Benjamin Martinez, age 20 years, had his skull fractured; died in twenty minutes after the injury. Cause: He was taking down some rock in the face of his room, and after working at it for about an hour he gave it up and thought it was safe, and commenced taking out coal when the rock gave way and caught him, injuring him so he lived only twenty minutes. No coroner's report.

March 26, 1898.—Antonio Vignasa, Italian, age 32 years, was crushed by a fall of rock and instantly killed at Cook & White mine. No coroner's jury.

April 8, 1898.—At Cook & White mine, John Foster, an Englishman, was injured at about 8 30 o'clock a. m., and died at 2.30 p. m. Cause: He was found 34 feet back in the entry behind a canvas curtain. He had put in a shot and retired when the explosion occurred. A piece of coal weighing about 15 pounds struck him in the side with fatal effect, causing a fracture of six ribs in right side, commencing third downward, the end of which perforated the lungs. Number in family: Wife and one child. No coroner's jury.

December 5, 1897.—At White Ash mine, J. H. Curley, Irishman, age 25 years, received a compound fracture of right leg, junction lower and middle third, also extreme lacerated wound under side of right knee joint, and scalp wound about the size of a silver dollar on crown of head. Cause: In letting down cars from the plane the miners place a prop upright from top to bottom of place where they are working; this should be put up secure enough to hold when the weight of the loaded car, which is let down the plane by means of a rope being put around the prop; but it seems that the deceased failed to make the prop secure and it came down. The man got entangled in the rope and received the injury, as stated above. He was removed to the hospital at Santa Fe, and died on December 8, 1897, at 12 o'clock midnight.

TABLE OF NONFATAL ACCIDENTS.

Mine.	Date.	Name.	Character of injury.	Cause.
Blossburg, Gardiner, N. Mex. . .	June 22, 1896	Antonio Lucero . . .	Back broken	Fall of rock.
Do	Dec. 24, 1897	Jesus Gonzales . . .	Leg broken	Do.
Cook & White, Madrid, N. Mex. .	Sept. 23, 1897	Anton Bianichi . . .	Left leg broken . . .	Do.
Do	June 16, 1898	John Brown	Partial dislocation of back.	Do.
Do	July 7, 1897	John Tomasco	Two scalp wounds . .	Shot went off on him.
Do	do	Emil Leplat	Severe contusion of right ankle joint.	Engineer jerked the trip.
White Ash, Madrid, N. Mex. . .	Dec. 5, 1897	Elesio Mitchletti . .	Simple fracture of right leg.	Runaway car.
Do	do	A. Mitchletti	Right leg broken . . .	Do.
Do	Nov. 1, 1897	Thos. Thomas	Left leg broken . . .	Fall of rock.
Lucas Mine, Madrid, N. Mex. . .	Mar. 9, 1898	John Beirman	Sprained back	Do.
Otero Mine, Gallup, N. Mex. . .	Jan. 5, 1898	August Alary	Leg dislocated	Foot caught in loaded car.
Do	Jan. 18, 1898	Peter Goline	Struck in eye with pick.	Carelessness.
Do	June 9, 1897	Jas. Martinez	Leg broken	Fall of rock.
Sunshine, Gallup, N. Mex. . . .	Feb. 25, 1898	Ed. Crisan	Double fracture of leg.	Do.

RECORD OF NONFATAL ACCIDENTS.

December 14, 1897.—At Blossburg mine, Jesus Gonzales, a laborer, age 40 years, was injured by a fall of slate rock weighing about 200 pounds. He was working with mining machine when the rock fell on him, breaking his leg.

June 22, 1898.—At Blossburg mine, Antonio Lucero, Mexican, age 32 years, was injured by a fall of rock, having his back broken. Cause: He was loading coal by the ton, and did not examine the roof before commencing work. The rock fell on him while in a stooping position, and broke his back. On August 5th I received a letter from the acting superintendent of the mine advising me that the man was still living.

September 23, 1897.—At the Cook & White mine, Anton Bianichi, an Italian, age 34 years, was injured by having his left leg broken. Cause: He was working in the first right dip plane, and was caught by a fall of rock, breaking his leg.

June 16, 1898.—At Cook & White mine, John Brown, Scotchman, age 50 years, was injured in the first left dip plane. Cause: Was caught by a fall of rock, causing partial dislocation of back.

July 7, 1897.—At Cook & White mine, Emil Leplat, Frenchman, age 26 years, was injured in No. 1 right entry. Cause: Engineer jerked the trip suddenly and caught him, causing severe contusion of right ankle joint, fracture right fibular in lower third.

July 7, 1897.—At Cook & White mine, John Tomasco, Italian, age 35 years, was injured in No. 2 plane. Cause of injury: Shot went off on him, causing two scalp wounds—one over right frontal bone, 6 inches long, and one 4 inches long above and to right of occipital protuberance.

November 1, 1897.—At White Ash mine, Thomas Thomas, a native of Wales, age 27 years, was injured in No. 3 right entry. Cause: Was caught by a fall of rock, breaking his left leg.

December 5, 1897.—At White Ash mine, Elesio Mitchletti, Italian, age 30 years, was injured in second left plane on second left entry. Cause: He got entangled in a rope while letting down a pit car loaded with coal and received a simple fracture of the right leg in middle third.

December 5, 1897.—At the White Ash mine, A. Mitchletti, Italian, age 30 years, was injured. Cause: He was letting a pit car down with a rope when he got entangled in the rope, breaking his right leg.

March 9, 1898.—At the Lucas mine, John Beirman, German, age 43 years, was

injured at face of No. 2 raised plane. Cause: A fall of rock caught him, spraining his back.

January 18, 1898.—At Otero mine, Peter Golino, Italian, age 48 years, was injured by a piece of coal striking him in the eye.

January 5, 1898.—At Otero mine, August Alary, a native of France, age 30 years, had his leg dislocated. Cause: He was dropping car from face of room and was in front of it; tried to get out of the way of the car, but was caught and fell, dislocating leg.

February 23, 1898.—At the Otero mine, James Martinez, Mexican, age 28 years, was injured by having his thigh bone broken. Cause: He was undercutting coal with a pick when a piece of the roof fell on him and broke his thigh.

February 25, 1898.—At Sunshine mine, Ed. Crisen, Italian, age 25 years, was injured in slope (air course). Cause: He was mining coal when a piece of the roof known as a pot slip fell on him, causing a double fracture of his leg.

Table showing name of mine, method of working, ventilation, and power.

Mine.	Method of working.	Ventilation.	Power.
Beacon Hill.....	Slope, double entry, room and pillar.....	Furnace.....	Steam.
Canavan & Bailey.....	Slope, single entry, room and pillar.....	do.....	Do.
Crown Point.....	Double compartment shaft.....	Fan.....	Do.
Gallup.....	Slope, double entry, room and pillar.....	do.....	Do.
Otero.....	Drift, single entry, room and pillar.....	Furnace.....	Do.
Rocky Cliff.....	do.....	do.....	Horse.
Sunshine.....	Slope, double entry, room and pillar.....	Fan.....	Steam.
Blossburg.....	Drift, double entry, room and pillar.....	do.....	Do.
Mesa.....	Drift, single entry, room and pillar.....	Air shaft.....	Horse.
Smith No. 2.....	do.....	Furnace.....	Do.
Monero Nos. 1, 2, and 3.....	Slope, single entry, room and pillar.....	do.....	Steam.
Carthage.....	do.....	Air shaft.....	Horse.
Cook & White.....	Slope, double entry, room and pillar.....	Two fans.....	Steam.
Lucas.....	do.....	Fan.....	Do.
White Ash.....	do.....	do.....	Do.
Catalpa.....	do.....	Furnace.....	Do.
W. A. Clark.....	do.....	Natural.....	Do.
Mulholland & Casna.....	Slope, single entry, room and pillar.....	Air shaft.....	Horse.

AIR MEASUREMENTS.

The following table shows the number of cubic feet of air per minute entering the mines and returning, measured at intake and outlet:

Mine.	Date.	Intake.	Outlet.	Mine.	Date.	Intake.	Outlet.
Otero.....	Sept. 18, 1897	4,500	5,000	Monero.....	Oct. 27, 1897	13,440	13,600
	Nov. 11, 1897	10,290	10,550	Monero No. 2.....	Oct. 28, 1897	6,000	
	Jan. 11, 1898	12,080	12,405	Cook & White.....	Sept. 8, 1897	27,000	30,405
	Mar. 11, 1898	8,050	8,400		Oct. 14, 1897	30,000	
Gallup.....	Sept. 21, 1897	24,000	24,075		Oct. 15, 1897		33,000
	Nov. 15, 1897	30,000	30,300		Nov. 23, 1897	39,250	
Sunshine.....	Sept. 16, 1897	27,840	25,200		Nov. 24, 1897	35,000	36,050
	Nov. 13, 1897	26,460	26,250		Dec. 16, 1897	44,000	
	Jan. 12, 1898	28,600	28,800		Jan. 21, 1898	41,750	39,780
	Mar. 9, 1898	40,000	41,000		Jan. 24, 1898	43,500	43,200
Crown Point.....	Sept. 17, 1897	16,660	16,800		Feb. 17, 1898	35,000	
	Nov. 12, 1897	17,920	18,000		Feb. 18, 1898		43,800
	Jan. 13, 1898	19,960	21,840		Mar. 16, 1898	39,750	
	Mar. 12, 1898	19,950	20,540		Apr. 13, 1898	40,000	
Rocky Cliff.....	Sept. 15, 1897	6,300	6,475		June 18, 1898	40,000	42,000
	Nov. 16, 1897	2,730	3,040	White Ash.....	Sept. 9, 1897	36,960	40,000
	Jan. 10, 1898	6,500	6,550		Oct. 16, 1897	38,550	41,200
	Mar. 9, 1898	5,510	6,450		Jan. 25, 1898	41,860	49,600
Mulholland & Casna.....	Jan. 14, 1898	4,000			Feb. 16, 1898	34,400	43,875
Blossburg.....	Oct. 9, 1897	8,400			Mar. 19, 1898	28,000	
	Dec. 9, 1897	18,840	19,040		Apr. 12, 1898	41,560	42,240
	Feb. 10, 1898	8,160			June 20, 1898	35,530	36,840
	Feb. 11, 1898	37,500	39,000	Lucas.....	Oct. 19, 1897	15,800	16,800
	Mar. 25, 1898	34,560	36,015		Nov. 25, 1897	11,000	12,250
	Apr. 21, 1898	33,600	34,200		Dec. 8, 1897	15,920	16,450
	June 25, 1898	26,400	27,000		Jan. 27, 1898	16,800	18,275
Smith Mine No. 2..	Oct. 6, 1897	2,160	2,340		June 21, 1898	9,130	
	Feb. 8, 1898	1,960	2,180	Carthage.....	Sept. 27, 1897	1,750	1,787
	Mar. 23, 1898	1,800	1,950				
	Apr. 19, 1898	2,100	2,275				
	June 23, 1898	2,400	2,560				
Mesa.....	Oct. 11, 1897	1,750	1,800				
	June 23, 1898	1,400	1,575				

MINES NOT INSPECTED.

During the fiscal year I have written letters several times to coal-mine operators in San Juan and Lincoln counties, N. Mex., requesting that a report of the mines be forwarded to me, giving the production, number of men employed, etc., but I have received no reply. Owing to the location of the mines, being a great distance from the railroad, and only a very few if any men being employed, and only during the winter months, I did not deem it necessary to inspect the properties. In former years there were not more than 7 or 8 men employed in either San Juan or Lincoln counties.

MINES NOT IN OPERATION.

Green & Bailey mine, Santa Fe County, not operated this year.
 Hartsell mine, Colfax County, not operated this year.
 Mulholland mine, Bernalillo County, not operated this year.
 Smith mine No. 1, Colfax County, not operated this year.
 Sterling mine, Rio Arriba County, not operated this year.
 Waldo mine, Santa Fe County, not operated this year.
 Miller Gulch mine, Santa Fe County, not operated this year.

NEW MINES OPENED THIS YEAR.

W. A. Clarke mine, Bernalillo County.
 Mulholland & Casna mine, Bernalillo County.

Prices paid for labor, mining coal, etc., by the Crescent Coal Company, Gallup, N. Mex.

Mining coal per ton of 2,000 pounds, screened coal.....	\$0.70
Driving entry.....per yard..	2.00
Room turning.....	4.00
Crosscuts.....per yard..	1.50
Timbers.....per set..	.50
Company men under ground.....per day..	3.00
Boys attending to doors.....do.....	1.00
Engineers per month.....	80.00
Boiler men.....per day..	2.25
Tipple men.....do.....	3.00
Blacksmiths.....do.....	3.00
Blacksmiths' helpers.....do.....	2.50
Carpenters.....do.....	3.00

Prices of powder and supplies for miners, Crescent Coal Company.

Powder.....per keg..	\$4.00
Lamp oil.....per gallon..	1.25
Lamp cotton.....per ball..	.05
Squibs.....per box..	.25

Prices paid for labor, mining coal, etc., by Cerrillos Coal Railroad Company, at Madrid, N. Mex.

Mining coal per ton of 2,000 pounds, screened—	
White ash.....	\$0.70
Cook & White.....	.85
Lucas.....	.90
Driving main entry.....per yard..	3.00
Driving back entry.....do.....	1.75
Driving crosscuts.....do.....	1.50
Driving main slope when in natural coal.....do.....	6.00
Driving main slope when in faults or solid rock.....do.....	9.00
Driving raised planes.....do.....	1.75
Turning rooms off entry and driving room, 30 feet.....	8.00
Setting rough 7-foot timbers.....	1.00
Setting timbers over 7 feet in length.....	2.00
Setting 7-foot props.....	.07
Wages paid—	
Pit bosses.....per day..	3.00
Fire bosses.....do.....	3.00
Track layers.....do.....	2.75

Wages paid—Continued.

Company timbermen	per day..	\$2. 75
General company men	do	2. 60
Single mule drivers	do	2. 60
Team drivers	do	2. 75
Rope riders	do	3. 00
Car couplers	do	2. 75
Assistants to company men	do	2. 00

Prices of powder and supplies for miners of the Cerrillos Coal Railroad Company.

Powder	per keg..	\$2. 60
Lamp oil	per gallon..	. 85
Lamp cotton	per ball..	. 05
Squibs	per box..	. 25

WHITE ASH MINE.

Statement of work done in the White Ash mine for the fiscal year ended June 30, 1898.

Entry.	Length.		Number of rooms.		Remarks.
	Total feet.	Driven since June 30, 1897.	Total feet.	Turned since June 30, 1897.	
Main slope	3, 465	.....	.....	.....	Pillars pulled to within 1,100 feet of mouth.
First north	700	.....	9	.....	Abandoned prior to July 1, 1897.
Second north	1, 587	.....	21	.....	All pillars pulled.
Third north	2, 010	.....	25	.....	Do.
Fourth north	2, 170	.....	28	.....	Do.
Fifth north	1, 655	.....	22	.....	Do.
Sixth north	1, 540	.....	19	.....	Do.
Seventh north	1, 844	.....	14	.....	Do.
Eighth north	1, 332	.....	11	.....	Do.
Ninth north	1, 060	.....	7	.....	Do.
Tenth north	840	.....	17	.....	Do.
First south	1, 000	.....	15	.....	Abandoned prior to July 1, 1897.
Second south	1, 960	.....	21	.....	Pillars pulled back to main slope.
Third south	1, 990	.....	22	.....	Do.
Fourth south	1, 210	.....	14	.....	Do.
Fifth south	670	.....	7	.....	Do.
Sixth south	580	.....	5	.....	Do.
Seventh south	270	.....	4	.....	Do.
Eighth south	260	.....	.....	.....	Do.
New entry above first south	900	900	7	7	Stopped June 30, 1898, starting back on pillars.

New entry driven north above old first north a distance of 1,100 feet; 20 rooms turned and pillars drawn back to within 600 feet of main slope, and all work done since June 30, 1897.

LUCAS MINE.

Statement of work done in the Lucas mine for the fiscal year ended June 30, 1898.

Entry.	Length.		Number of rooms.		Remarks.
	Total feet.	Driven since June 30, 1897.	Total feet.	Turned since June 30, 1897.	
Main slope	1, 400	.....	.....	.....	Main return for air.
First north	280	.....	4	.....	Pillars pulled to within 275 feet of slope.
Second north	980	.....	15	.....	Pillars pulled to within 250 feet of slope.
Third north	810	.....	12	.....	Do.
Fourth north	570	.....	6	.....	Do.
Fifth north	100	.....	.....	.....	Pillars pulled to within 1,000 feet of slope.
First south	1, 700	.....	24	.....	Entry being further developed.
Second south	2, 628	723	29	2	Entry not driven since Jan., 1898.
Third south	1, 522	280	19	3	Entry being further developed.
Fourth south	1, 971	900	21	10	Entry not driven since Sept., 1897.
Fifth south	500	.....	5	.....

COOK & WHITE MINE.

Statement of work done in the Cook & White mine for the fiscal year ended June 30, 1898.

Entry.	Length.		Number of rooms.		Remarks.
	Total feet.	Driven since June 30, 1897.	Total feet.	Turned since June 30, 1897.	
Main slope	1,814	270	14	.....	Stopped Apr. 1, 1898; new slope being driven 800 feet north.
New slope	320	320	.....	.....
First north entry	1,282	.....	36	30	Entry stopped; all rooms finished; no pillars pulled.
Second north	2,170	1,703	10	10	Stopped temporarily.
Third north	210	210	.....	.....	Being further developed.
First south	4,047	1,627	76	38	12 rooms working.
Second south	2,442	1,886	6	6	Being further developed.
Third south	471	471	.....	.....	Do.

PRODUCTION OF COKE.

All the coke produced in the Territory was produced at the Blossburg mine, Gardiner, Colfax County, N. Mex.

The amount produced was 2,275 tons during the fiscal year. Very little coke was produced during the year on account of the coal washers not being completed till very late in fiscal year.

The coke produced was shipped and sold to the different smelting plants in the Territory of Arizona.

GENERAL REMARKS.

The thickness of the veins in nearly all of the mines where fire damp is generated is favorable to their proper ventilation, and while gas can not be prevented from generating, it could undoubtedly be prevented in the entries and rooms by having proper ventilation; also by crosscuts being driven more closely together, thus sweeping the gas out as fast as it generates.

Every superintendent and pit boss should make it his imperative duty to provide ventilation as the work advances, and he should not delay until he is compelled to make the proper provisions by allowing gas to form so as to cause severe and disastrous explosions.

Proper care and provisions and the knowledge that "eternal vigilance is the price of safety" would be a safeguard to the investments of the owner, and security for the life and limbs of those employed in the mines.

There are no Territorial laws governing the coal industries, and when the importance of the subject is properly represented before the Territorial legislature, certain restrictions should be placed on the manner of handling powder, as well as to ventilation and other matters, which would insure greater safety and protection to the miners and other persons connected with this growing industry.

In all the coal mines throughout the Territory the mine officials have expressed their willingness to comply with all requirements of the United States laws governing coal mining, and the main problem which confronts the mine inspector is to get the miners impressed with the necessity of looking out for themselves and use ordinary precaution in their own behalf.

A coal miner of experience needs no prompting or hints that the roof of his entry or room is in bad condition, and he should not need to be compelled to put in the necessary posts or timber to insure his protection; and carelessness in this respect often not only jeopardizes his life, but works to the injury of other miners and to the detriment of the management.

There may be some of the workmen or miners who would like to express their opinions relative to the ventilation or workings of the mine, and probably some would wish to accompany the mine inspector on his tour through the mines. This the inspector would heartily indorse, and would suggest that the miners select one of their number to accompany him through the mine while inspecting. A complaint may be made that the inspector on visiting the mine always asks for the superintendent or pit boss. There are two reasons why the inspector goes to the superintendent or pit boss.

In the first place, the miner does not wish to lose a day or so of work; and the second reason is that the pit boss is a responsible party for all defects in the working

of the mine, and is the proper person for the inspector to give instructions and orders to relative to ventilation and timbering at any point that the inspector thinks needs regulating.

But what would materially assist the inspector in the performance of his duty would be for the miners or workmen to adopt a system of reporting the condition of the mine to the inspector. This plan would probably result in a material benefit to the workingmen and could result in no injury to those concerned who intended to comply with the law, and would have a tendency to compel those who are careless to do their duty.

Some of the workmen may say that they are afraid to complain to the inspector for fear of being discharged; but this should not be allowed. The inspector has a right to question the workmen, and they should feel that they have a right to furnish information required by the inspector.

INSTRUCTIONS AND RULES.

The following are instructions and rules under which the Cerrillos Coal Railroad Company mines are to be governed, and all fire bosses will observe the same:

First. Do not remain off of duty without giving foreman due notice, so that he can put a man in your place.

Second. On beginning your shift's work your regular daily route will be: Commencing at mouth of slope, travel to face, and return from lower entry in slope to the upper entry in same, making a regular travel in all air-courses, and examine all places, including abandoned as well as working places, in each entry, with Davy safety lamp, or such other improved lamp as may be in use at the time.

Third. If you find the brattice or canvas shot down or damaged, repair it at once, so as to conduct the air to the face of the workings as soon as possible, and report in every instance where canvas is shot down to the foreman.

Fourth. Report in writing all places where gas is found; also verbally to foreman.

Fifth. If air courses are obstructed in any way by water or rock, etc., report same in writing, and verbally to foreman, that he may remedy it at once.

Sixth. Where roof of air course is bad, and looks dangerous and should be timbered or taken down, report same daily in writing and verbally to foreman.

Seventh. Do not allow any man to go into his place with naked light where standing gas is found or being generated freely. Give him a locked safety lamp and instruct him to use it instead of naked light until further advised by you. Any person that you find disobeying this rule report same to foreman at once, and he will be discharged from the employment of the company.

Eighth. If you should find a large quantity of gas at any time in the mine between shifts, report same at once to foreman and do not allow the men to go farther down the slope than lamp house, and the foreman will know from your report how to instruct further.

Ninth. Quantities of gas found in places on account of brattice or canvas shot down should always be removed by the fire boss, and not allow the men to enter the place until the gas is removed.

Tenth. Instruct men who are working with safety lamps to brush all gas from their places before firing shots.

Eleventh. Any fire found in the mine from shot firing, or otherwise, must be put out promptly, and call for assistance from any point if you are unable to extinguish it yourself.

Twelfth. Examine and clean all safety lamps thoroughly after every shift's use, and do not allow any defective lamps to be taken from the lamp house.

Thirteenth. Any lamps that are damaged by persons using them, or if they fail to return them at the expiration of each shift, report same to foreman and damages will be charged against them.

Fourteenth. Report all places to foreman where you think there is not a sufficient flow of air travelling to prevent the accumulation of gases.

Fifteenth. Travel the main return-air ways daily without fail.

Sixteenth. Put the danger mark (XX) at the entrance of all places that contain standing gas.

RULES GOVERNING THE CERRILLOS COAL RAILROAD COMPANY MINE FANS.

First. The fireman will attend to the fans when the engineers are off duty.

Second. The engineer when on duty will have full charge of fans and see that they are attended to.

Third. On commencing the shift's work, visit the fans and see whether they are in good order or not.

Fourth. If you find any of the fans in bad order notify the master mechanic at once.

Fifth. Do not stop the fan for any slight adjustment while men are in the mine.

Sixth. If either fan should get out of order so that it is necessary to stop it, close the trapdoor near the fan immediately after stopping the fan, and open trapdoor immediately when the fan is started up again.

Seventh. Notify the foreman before you stop either or both of the fans.

Eighth. Do not stop both fans at one time while men are in the mine unless you see that they will be totally destroyed by continuing to run them, and not then until you notify foreman to get men out of the mine.

Ninth. If a sudden breakdown should take place, or you should find one of the fans stopped, notify the foreman at once, then close the trapdoor, and notify the master mechanic.

Tenth. In case of breakdown of either of the fans, and master mechanic is not close at hand, the engineer and firemen must do everything that they can to get the fan in operation again as soon as possible.

Eleventh. Fans are to be kept speeded as per verbal instructions given to you from time to time by the master mechanic or superintendent.

Twelfth. Visit the fan every hour and notice if all the working parts are in good order.

Thirteenth. Notice the speed of the fan every thirty minutes.

Fourteenth. If anything occurs to the boilers or steam-pipe connections, or if a sufficient quantity of steam can not be kept up for both fans and hoist plant, stop hoisting till such time as you can recover and maintain the usual pressure of steam.

Names and addresses of superintendents or managers or pit bosses.

Mine.	Post-office.	Officer.
Beacon Hill.....	Gallup, N. Mex.....	T. A. Fabro, manager.
Sunshine.....	do.....	Hugh McGinn, superintendent; W. Weaver, general manager.
Canavan & Bailey.....	do.....	Stephen Canavan, manager.
Rocky Cliff.....	do.....	Do.
Otero.....	do.....	Alex. Bowie, general manager; John Steward superintendent.
Crown Point.....	do.....	Hugh McGinn, superintendent; W. Weaver, general manager.
Catalpa.....	do.....	Do.
Gallup.....	do.....	Do.
W. A. Clark.....	do.....	W. L. Bretherton, superintendent.
Mulholland & Casna.....	do.....	Gus Mulholland, manager.
White Ash.....	Madrid, N. Mex.....	James Duggan, superintendent; C. M. Higginson, vice-president, Chicago, Ill.
Lucas.....	do.....	Do.
Cook & White.....	do.....	Do.
Blossburg.....	Raton, N. Mex.....	Jas. A. Wigga, superintendent; Harry Whigham, general manager.
Smith mine No. 2.....	do.....	Henry Smith, manager.
Mesa.....	do.....	Thos. Griffiths, manager.
Carthage.....	San Antonio, N. Mex.....	Hilton & Luerra, managers.
Monero, Nos. 1, 2, and 3.....	Monero, N. Mex.....	J. H. Crist, manager.

RECOMMENDATIONS.

Deeming the present law governing the mining industry as inadequate, I beg leave to offer a few suggestions in the way of amendments thereto, as I have suggested and recommended in my previous reports.

First. That the owner or operator of each coal mine employing ten or more men should make, or cause to be made, an accurate map or plan of the workings of such coal mine on a scale not exceeding 100 feet to 1 inch, showing the bearings and distances of workings and the general inclinations of the strata or any material deflections in such workings, and the boundary lines of such coal mines, which shall be kept for the use of the inspector at the office of said mine in the county where such mine is located; and shall also furnish a true copy of such map or plan to the inspector of coal mines, to be filed in his office; and said owner or agent shall be caused to make on or before the 10th day of January and July of every year a statement showing the workings of the coal mine or mines. If the agent or owner of any coal mine shall neglect or refuse, or for any cause fail, for the period of one month after the time described, to furnish said map or plan as above required, or if the inspector should find or have reasons to believe the map or plan was inaccurate in any material part, he be authorized to cause a correct map or plan of the actual workings of such coal mine to be made at the expense of the owner thereof.

Second. The owner or agent of any coal mine, whether shaft, slope, or drift, shall provide and maintain for every such mine an amount of ventilation not less

than 150 cubic feet (where fire damp is known to exist) per minute per person employed in such mine, and also an amount of ventilation of not less than 500 cubic feet per minute for each mule or horse used in such mine, which shall be distributed throughout the mine in such a manner as to dilute and render harmless and expel the noxious and poisonous gases from each and every working place in the mine. Break-throughs or air ways should be driven at least every 60 feet, or closer if deemed necessary by the inspector, and an air way or break-through be made at the face of each and every abandoned room or entry. All break-throughs, except those last named near the working face of the mine, shall be closed up and made air-tight by brattice, trapdoor, or otherwise, so that the current of air in circulation in the mine may sweep to the interior of the mine where the persons employed in such mine are at work.

Third. Within twenty-four hours after abandonment of any working face in the mine all tracks, ties, and other material, if any, should be taken out, and all entrances and approaches to that particular place should be bratticed up or filled in with "goaf", except openings for ingress and egress of air; and in these two openings, immediately in the openings and not in the room and working face, danger signals should be placed in such a manner that an intruder could not avoid seeing them.

Fourth. All mines to be provided with artificial means of ventilation necessary to provide a sufficient quantity of air, such as fanning or suction fans, exhaust steam furnaces, or other contrivances of such capacity and power as to produce and maintain an abundant supply of air; but in case a furnace shall be used for ventilating purposes it shall be built in such a manner as to prevent the communication of fire to any part of the works by lining the upcast with any incombustible material for a sufficient distance up from said furnace. All mines generating fire damp shall be kept clear from standing gas, and every working place shall be carefully examined every morning with a safety lamp by a competent person or persons before any of the workmen are allowed to enter the mine, and the persons making such examinations shall mark on the face of the workings the day of the month, and report the condition of the mine at or near the pit top to the superintendent or pit boss; and in all the mines, whether they generate fire damp or not, the doors used in the assisting or directing the ventilation of the mine shall be so hung and adjusted that they will shut up of their own accord and can not stand open. The owner or agent shall employ a practical and competent overseer, to be called a mining boss, who shall keep a careful watch over the ventilating apparatus and the air ways, traveling ways, pumps, timber, and drainage; also shall see that as the miners advance their excavations all loose coal, slate, and rock overhead are carefully secured against falling in on the traveling way, and that sufficient props and caps of suitable length and size are furnished for the places where they ought to be used and placed in the working places of the miners. He should measure the ventilation at least three times per week at the inlet and outlet, and also near the face of all entries. A record on properly printed blanks should be kept of such measurements, and at the end of each week the mine inspector should be mailed a copy.

Fifth. The mining boss, or other competent person, should make daily inspection of ropes, chains, cages and other hoisting apparatus, guides and shaft timbers, and make a record of such daily inspection in a book kept in the office of such mine for that purpose. The mine boss should keep a daily record of any defect in the ventilating appliances and any standing gas that may be found in the mine, designating the entry and room in which the gas has been found. The record of the aforesaid inspection shall be kept open at all times for the inspection of the mine inspector.

Respectfully submitted.

JOHN W. FLEMING,
United States Mine Inspector for the Territory of New Mexico.

LAWS GOVERNING THE WORKINGS OF COAL MINES IN THE TERRITORIES.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in each organized and unorganized Territory of the United States wherein are located coal mines the aggregate annual output of which shall be in excess of one thousand tons per annum the President shall appoint a mine inspector, who shall hold office until his successor is appointed and qualified. Such inspector shall, before entering upon the discharge of his duties, give bond to the United States in the sum of two thousand dollars, conditioned for the faithful discharge of his duties.

SEC. 2. That no person shall be eligible for appointment as mine inspector under section one of this act who is not either a practical miner or mining engineer, and who has not been a resident for at least six months in the Territory for which he

shall be appointed; and no person who shall act as land agent, manager, or agent of any mine, or as mining engineer, or be interested in operating any mine in such Territory, shall be at the same time an inspector under the provisions of this act.

SEC. 3. That it shall be the duty of the mine inspector provided for in this act to make careful and thorough inspection of each coal mine operated in such Territory, and to report at least annually upon the condition of each coal mine in said Territory with reference to the appliances for safety of the miners, the number of air or ventilating shafts, the number of shafts or slopes for ingress or egress, the character and condition of the machinery for ventilating such mines, and the quantity of air supplied to the same. Such report shall be made to the governor of the Territory in which such mines are located, and a duplicate thereof forwarded to the Secretary of the Interior, and in case of an unorganized Territory directly to the Secretary of the Interior.

SEC. 4. That in case the said mine inspector shall report that any coal mine is not properly constructed or not furnished with reasonable and proper machinery and appliances for the safety of the miners and other employees, it shall be the duty of the governor of such organized Territory, it shall be the duty of the Secretary of the Interior, to give notice to the owners or managers of said coal mine that the said mine is unsafe and notifying them in what particular the same is unsafe, and requiring them to furnish or provide such additional machinery, slopes, entries, means of escape, ventilation, or other appliances necessary for the safety of the miners and other employees within a period to be in said notice named, and if the same be not furnished as required in such notice it shall be unlawful after the time fixed in such notice for the said owners or managers to operate said mine.

SEC. 5. That in all coal mines of the Territories of the United States the owners or managers shall provide at least two shafts, slopes, or other outlets, separated by natural strata of not less than one hundred and fifty feet in breadth, by which shafts, slopes, or outlets distinct means of ingress and egress shall always be available to the persons employed in said mine. And in case of the failure of any coal mine to be so provided, it shall be the duty of the mine inspector to make report of such facts, and thereupon notice shall issue, as provided in section four of this act and with the same force and effect.

SEC. 6. That the owners or managers of every coal mine at a depth of one hundred feet or more shall provide an adequate amount of ventilation of not less than fifty-five cubic feet of pure air per second, or thirty-three hundred cubic feet per minute, for every fifty men at work in said mine, and in like proportion for a greater number, which air shall by proper appliances or machinery be forced through such mine to the face of each and every working place, so as to dilute and render harmless and expel therefrom the noxious or poisonous gases; and all workings shall be kept clear of standing gas.

SEC. 7. That any mine owner or manager who shall continue to operate a mine after failure to comply with the requirements of this act and after the expiration of the period named in the notice provided for in section four of this act, shall be deemed guilty of a misdemeanor, and shall be fined not to exceed five hundred dollars.

SEC. 8. That in no case shall a furnace shaft be used or for the purpose of this act be deemed an escape shaft.

SEC. 9. That escape shafts shall be constructed in compliance with the requirements of this act within six months from the date of the passage hereof, unless the time shall be extended by the mine inspector, and in no case shall said time be extended to exceed one year from the passage of this act.

SEC. 10. That a metal speaking-tube from the top to the bottom of the shaft or slope shall be provided in all cases, so that conversation may be carried on through the same.

SEC. 11. That an improved safety-catch shall be provided and sufficient cover overhead on every carriage used in lowering or hoisting persons. And the mine inspector shall examine and pass upon the adequacy and safety of all such hoisting apparatus.

SEC. 12. That no child under twelve years of age shall be employed in the underground workings of any mine, and no father or other person shall misrepresent the age of anybody so employed. Any person guilty of violating the provisions of this section shall be guilty of a misdemeanor, and upon conviction thereof shall be fined not to exceed one hundred dollars.

SEC. 13. That only experienced and competent and sober men shall be placed in charge of hoisting apparatus or engines, and the maximum number of persons who may ascend or descend upon any cage or hoisting apparatus shall be determined by the mine inspector.

SEC. 14. That it shall be lawful for any inspector to enter and inspect any coal mine in his district and the working machinery belonging thereto, at all reasonable times, but so as not to impede or obstruct the working of the mine; and to make

inquiry into the state of the mine, works, and machinery, and the ventilation and mode of lighting the same, and into all matters and things connected with or relating to the safety of the persons employed in or about the same, and especially to make inquiry whether the provisions of this act are complied with; and the owner or agent is hereby required to furnish means necessary for such entry, inspection, examination, and inquiry, of which the said inspector shall make an entry in the record of his office, noting the time and material circumstances of the inspection.

SEC. 15. That in all cases of fatal accident a full report thereof shall be made by the mine owner or manager to the mine inspector, said report to be in writing and made within ten days after such death shall have occurred.

SEC. 16. That as a cumulative remedy, in case of the failure of any owner or manager of any mine to comply with the requirements contained in the notice of the governor of such Territory or the Secretary of the Interior, given in pursuance of this act, any court of competent jurisdiction, or the judge of such court in vacation, may, on the application of the mine inspector in the name of the United States and supported by the recommendation of the governor of said Territory or of the Secretary of the Interior, issue an injunction restraining the further operation of such mine until such requirements are complied with, and in order to obtain such injunction no bond shall be required.

SEC. 17. That wherever the term "owner or manager" is used in this act the same shall include lessees or other persons controlling the operation of any mine, and in case of the violation of the provisions of this act by any corporation, the managing officers and superintendents, and other managing agents of such corporation shall be personally liable and shall be punished as provided in act for owners and managers.

SEC. 18. That the mine inspectors provided for in this act shall each receive a salary of two thousand per annum, and their actual traveling expenses when engaged in their duties.

SEC. 19. That whenever any organized Territory shall make or has made provision by law for the safe operation of mines within such Territory, and the governor of such Territory shall certify said fact with a copy of said law to the Secretary of the Interior, then and thereafter the provisions of this act shall no longer be in force in such organized Territory, but in lieu thereof the statute of such Territory shall be operative in lieu of this act.

Approved, March 3, 1891.

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HEADS OF DIFFERENT DEPARTMENTS, 1897-98.

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THOMAS B. HOOD, A. M., M. D., Dean of Medical Department.
B. F. LEIGHTON, LL. D., Dean of Law Department.
Rev. F. W. FAIRFIELD, D. D., Dean of College Department.
GEORGE J. CUMMINGS, A. M., Dean of Preparatory Department.
GEORGE WILLIAM COOK, A. M., Dean of Normal Department.
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HOWARD, Instructors in Industrial Work.

REPORT

OF THE

PRESIDENT OF HOWARD UNIVERSITY.

HOWARD UNIVERSITY,
Washington, D. C., July 18, 1898.

SIR: In compliance with the requirements of the sundry civil bill in connection with the appropriation for Howard University, I have the honor to make the following report, showing "the number of pupils received and discharged during the school year and the number remaining;" "also the branches of knowledge and industry taught and the progress made therein."

For convenience I render the report by departments.

NORMAL DEPARTMENT.

In the normal department there were enrolled	184
Number withdrawn at the request of the faculty	2
Number leaving school of their own accord without the knowledge and consent of the teachers	62
	— 64
Number at close of the school year	120

The department is divided as follows, each class representing one year:

The highest or post-graduate class; the fourth-year class; the third-year class; the second-year class; the first-year class; "A" and "B" classes, and unclassified students.

The following branches are taught in the various classes: Arithmetic, algebra, geometry, reading and spelling, English grammar, English composition, rhetoric, English literature, geography, physical geography, general history, United States history, history of education, science of government, mental science, political economy, civil government, pedagogy, botany, theory and art of teaching, practice in teaching, physics, chemistry, carpentry, printing, tinning, sewing, drawing, stenography, typewriting, Latin, music, bookkeeping, higher arithmetic, astronomy, and physiology.

There is also a practice school, taught by a lady, who is a thoroughly educated normal teacher. Her school consists of from 20 to 30 children below any of the established grades of the university, and the advanced pupils in the normal department are required to spend a portion of each day learning how to teach under her instruction.

This branch of the normal department has only been established one year, and it promises to be a very successful adventure.

With few exceptions the progress made during the year has been satisfactory and the standard of the school has been raised.

PREPARATORY DEPARTMENT.

The preparatory department, which fits students for college, is divided into four classes, each representing one year's study.

In the senior class 13 members entered school, one of whom left of his own accord, leaving 12 at the end of the year. In this class the subjects taught are as follows: Virgil, Anabasis, Iliad, German, English classics, astronomy, essays, declamations, and discussions during the year.

The middle class entered with 22 students. One student was sent away by the faculty. Number left during the year, 21. In this class the following are the subjects taught: Cicero, Greek lessons, physics, chemistry, algebra, English classics, and essays.

In the junior 34 students were received. One left during the year and two were sent away by the faculty. Number remaining at the end of the year, 31. The subjects taught are as follows: Cæsar, Latin composition, Greek and Roman history, English classics, geometry, and manual training, such as carpentry, printing, and tinning.

The first-year or lowest class entered with 32. Two have died, 1 was sent away by the faculty, and 5 left of their own accord.

The number remaining at the end of the year, 24. The subjects taught are as follows: Introductory Latin, algebra, English composition, elementary rhetoric, music, drawing, physiology, manual training four times a week.

The results secured in the year's work have been quite satisfactory in all the branches.

The whole number received.....	101
Number left during the year.....	13
Number remaining at the end of the year.....	88

COLLEGE DEPARTMENT.

The college department received at the commencement of the year.....	46
Number leaving during the year.....	8
Number remaining.....	38

These are classified, as in all other American colleges, into seniors, juniors, sophomores, and freshmen.

There are in the senior class 9, of whom 7 graduated with the degree of A. B., 1 from the literary course, and 1 B. S.

The junior class has 2 members, the sophomore class has 8 members, the freshman class has 19 members, and 8 have pursued special studies.

The subjects taught are as follows: Algebra, geometry, trigonometry, analytics, physics, chemistry, geology, zoology, botany, mineralogy, biology, physiology, meteorology, rhetoric, English history, Greek, Latin, French, German, psychology, moral philosophy, natural theology, evidences of Christianity, Constitution of the United States, international law, political economy, and Bible study.

There has been within the last year a course of lectures delivered in pedagogy, to which all advanced students in the university who wish to learn that branch and all teachers of the colored public schools of this city are invited. This important branch will be continued hereafter; though as yet no sufficient provision has been made by Congress for a professor in pedagogy. The need of \$1,500 additional on the salary account is commended to the attention of the honorable Secretary, with the respectful request that he recommend this amount

additional to the last year's appropriation; it having this year received the favorable attention of the honorable committee of appropriations in the Senate, who provided that the instruction should be given, and yet made no provision for compensation for the same.

As a whole, commendable progress has been made in the above-named branches.

MEDICAL DEPARTMENT.

In the medical department, which includes the dental and pharmaceutical courses, there were at the commencement of the session 160, divided as follows:

Candidates for the degree of M. D.	110
Candidates for the degree of D. D. S.	24
Candidates for the degree of Phar. D.	22
Students pursuing special courses	4
Total	160

During the year there were 12 of these who left because they could not pay their expenses. About one-half of those who remained were unable to pay in full.

All of the classes completed their year's work, and the professors are much pleased with the graded course of instruction.

There were graduated in the month of May from the regular medical course.	32
Number graduated from the dental course	5
Number graduated from the pharmaceutical course	7
Total	44

The branches taught are as follows: Anatomy, physiology, materia medica, therapeutics, chemistry, histology, bacteriology, pathology, obstetrics, gynecology, practice of medicine, surgery, eye and ear, medical jurisprudence, pediatrics, hygiene and sanitation, principles and practice of operative dentistry, dental pathology, prosthetic dentistry, crown and bridge work, pharmacy, and botany.

LAW DEPARTMENT.

The whole number received	96
Number left the department of their own volition	8
Number remaining at the end of the year	88

The above are divided into juniors, seniors, and post graduates.

There were graduated with the degree of LL. M.	12
There were graduated with the degree of LL. B.	23

The branches taught are the same as those of other law schools in the city of Washington, as follows: Blackstone's Commentaries, Williams on Real Property (with Indemaur's Common Law Cases), Bishop on Contracts (enlarged edition), Norton on Bills and Notes, Schouler on Domestic Relations, Clark on Criminal Law, Hale on Torts, Clark on Criminal Procedure, Shipman on Common Law Pleading, Fetter on Equity, Shipman on Equity Pleading and Practice, Darlington on Personal Property, Greenleaf on Evidence (3 vols.), Bateman on Commercial Law, Cooley on Constitutional Law, Woolsey on International Law, Schouler on Executors and Administrators, and Clark on Corporations.

The students as a whole attained good averages, and I might also add that there was a larger number than has been the case for years previous, properly equipped by previous training for entering upon the

study of law. Making all due allowances for the disadvantages under which the majority of our students labor, growing out of their lack of means for securing conveniences essential to student life, I regard the year as having been a very successful one, and as affording just ground for cherishing bright hopes for the future.

THEOLOGICAL DEPARTMENT.

The theological department, which is not supported in any degree by Congress, makes the following report:

Whole number of pupils during the year	36
Number left during the year	8
Number at close of the year	28

The following are the branches taught: Greek and Hebrew Scriptures, English Bible, Biblical history and antiquities, systematic theology, church history, homiletics, Christian missions, pastoral theology, moral philosophy, natural theology, evidences of Christianity, elocution, rhetoric, and vocal music.

The progress made has been excellent. The standard of scholarship is rising, and the conditions of graduation are from time to time increased. Some of the students pay their own way entirely by work. Nearly, probably quite, all of them are engaged in various kinds of Christian work. Many denominations are represented, and all work in perfect harmony.

RECAPITULATION.

Number enrolled:	
Normal department	184
Preparatory department	101
College department	46
Medical department (including dental and pharmaceutical departments) ..	160
Law department	96
Theological department	36
	623
Number left during the year:	
Normal department	64
Preparatory department	13
College department	8
Medical department	12
Law department	8
Theological department	8
	113
Total	510

In general, I beg leave to report that the university never has been so well attended as during the past year. Its work also has been wholly harmonious and healthful. I wish to call especial attention to the fact that a large number of our pupils come from out of the District and are entitled to no school privileges here, and that they are taught as economically in the university as they could be elsewhere. They are from 37 different States and Territories, besides from Burmah, Bulgaria, Canada, Korea, Japan, Switzerland, South America, Turkey, and West Indies.

We are trying to make advances in our normal department, and Congress recognizes that fact by appropriating money especially for pedagogical instruction, so that the whole university may keep apace with the progress of pedagogical science. A practice school has also been established for teachers. The work of the other departments has been well sustained during the year.

The university is especially grateful for the increase of \$1,000 for repairs. Our buildings are old and need constant attention. We have to replace a portion of the front of Miner Hall the present year. It will be good economy and protract the use of our buildings if the Government will give us the same amount for the year ending June 30, 1900.

Following is a statement of the payment of the amount appropriated by Congress, viz:

EXPENDITURE OF APPROPRIATION.

The appropriation bill requires the proper officer of the university to report how the appropriation is expended, and in compliance with this requirement I have the honor to add the following:

Seven professors and heads of the normal, preparatory, and college departments, respectively, \$1,500 each	\$10,500
One assistant professor	900
Two lady teachers in the normal and college departments, \$1,000 each	2,000
One assistant professor and one instructor, \$800 each	1,600
One lady teacher	630
One matron and physician	540
Two teachers in the normal department, \$450 each	900
Secretary, treasurer, and business manager	1,600
One lady teacher	800
Teacher and librarian, respectively, \$330 and \$500	830
Total instructors in academic branches, and business manager	20,300
One dean and professor of the law department	2,000
Two professors in the law department, \$1,500 each	3,000
One professor and librarian	1,200
Two lecturers, \$500 each	1,000
	7,200

The sum of \$3,000, appropriated for the manual-training school (industrial department), was expended as follows:

For instructors in carpentry, printing, sewing, bookbinding, and tinning ..	\$2,475.52
For janitor and fireman	125.00
For fuel	70.91
Lumber, hardware, and other material for carpenter shop, tin shop, printing office, bookbindery, etc	328.57
	3,000.00

The university expended during the year something over \$3,000 for repairs of buildings, of which sum \$1,000 was appropriated by Congress; the appropriation of \$900 for the "Law and general library books" was expended under the direction of the several faculties, one-half going to the law department library and the other half to the general library. The books were purchased of the lowest bidder in each case. The bids were all submitted to the honorable Secretary of the Interior and the purchases made by his authority; and the sum of \$200 appropriated for "Chemical apparatus" was used by the professors of chemistry, physics, and natural history, after submission of proposals to the honorable Secretary of the Interior. Nothing was expended, directly or indirectly, for the theological department.

Before closing this report, I beg leave to call the attention of the honorable Secretary of the Interior to the unsanitary condition of the park lying between the Freedman's Hospital and the university grounds, a matter already brought to his attention in a personal note, but now officially submitted.

I append herewith the treasurer's statement of receipts and disbursements for the entire year, showing the sources from which all moneys are received and for what expended.

Very respectfully,

J. E. RANKIN, *President.*

The SECRETARY OF THE INTERIOR.

AUGUST 21, 1898.

MY DEAR SIR: As guardian of both the Freedman's Hospital and Howard University, you should know that the Government received by deed from the university (act approved June 16, 1882, 22 Stat., 104), the park lying between the institutions above named, the condition being that the land should be reserved as a park forever. The Government has done nothing to grade or drain or fence, or in any way protect it. The noble old oaks are dying every year. At some seasons there is a marahy condition of land near the hospital, and in case of great rains the hospital grounds are largely flooded. To this condition of affairs I am myself a witness.

I call the especial attention of the honorable Secretary to this, as in the line of the work of the board of visitors for Freedman's Hospital appointed by him, and so far as I remember embracing matters to which their attention was not directed.

With great respect, very truly,

J. E. RANKIN,
President Howard University.

Hon. C. N. BLISS, *Department of the Interior.*

AN ACT for the relief of Howard University, approved June 16, 1882 (22 Stat., 104).

Whereas the Howard University is an educational institution incorporated by act of Congress, the grounds and building of which were obtained, under the authority of the United States, with funds appropriated by Congress; and

Whereas the said university, in consideration of the provisions of this act, proposes to convey, by a sufficient deed, to the United States the parcel or square of ground bounded by Pomeroy street, Four-and-a-half street, College street, and Sixth street, known as University Park, containing about eleven acres, to be used as a public park under the superintendence of the United States, provided that whenever the same shall cease to be used as a public park the title thereto shall revert to the Howard University: Therefore,

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the conveyance of the premises described in the preamble to this act, in the manner and upon the terms and consideration therein mentioned, be, and is hereby, accepted by the United States.

SEC. 2. That all taxes, penalties, interest, and costs upon the real and personal property of the Howard University due, or to become due, and unpaid at the date of the passage of this act, be, and the same are hereby, remitted.

SEC. 3. That the property, real and personal, of the said university shall be exempt from taxation so long as such property shall be used only for the purposes set forth in the charter of said institution: *Provided,* That nothing in this act shall exempt any real estate of said university from assessment and liability for special improvements authorized by law: *Provided also,* That this act shall not include any real estate sold or contracted to be sold by said university to any other person than the United States, the title to which may be still in the said university.

Treasurer's statement of receipts and disbursements from July 1, 1897, to June 30, 1898.

ACCOUNT PERTAINING TO CURRENT EXPENSES.

RECEIPTS.

Balance on hand July 1, 1897	\$135.36
From United States, for salaries of officers and professors:	
Academic branches	20,900.00
Industrial department	3,000.00
Chemical apparatus	200.00
Law and general library books	900.00
Buildings and grounds	1,000.00

Statement of receipts and disbursements from July 1, 1897, to June 30, 1898—Continued.

ACCOUNT PERTAINING TO CURRENT EXPENSES—continued.

RECEIPTS—continued.

From rents	\$4,461.11
From income from investments	7,200.58
From students' rooms	1,483.00
From proceeds of shops	91.33
From miscellaneous sources	531.00
By transfer from general endowment fund to pay for repairs at Freedmen's Hospital in December and make up deficiency in current expenses	1,826.00
	<u>41,128.38</u>

EXPENSES.

Salaries, academic departments and officers	25,338.95
Industrial department	3,073.69
Chemical apparatus	200.00
Law and general library	900.10
Buildings and grounds (Congressional appropriation)	1,000.00
Repairs of buildings	1,932.76
Care of grounds	284.34
Fuel and gas	1,780.15
Janitors, firemen, and watchmen	2,176.52
Insurance	938.72
Miscellaneous expenses, including postage, telephone, stationery, tuning pianos, advertising, clerk hire, diplomas, water bills, catalogues, repair and purchase of stoves and latrobes, furniture for matron, iron cots, mattresses, window screens for Clark Hall, miscellaneous labor (annual cleaning of buildings), and other bills of the same character	2,603.09
Interest on \$15,000 to medical department	900.00
Balance on hand June 30, 1898 .....	.06
Total	<u>41,128.38</u>

Medical department:

By balance on hand July 1, 1897	25.25
By cash, Dr. F. J. Shadd, treasurer	7,767.50
By interest on \$15,000	900.00

To professors and lecturers	\$6,195.00
To Dr. Shadd, commission	375.00
To apparatus, printing, janitors, gas, etc	2,098.46
To balance, June 30, 1898	26.29
	<u>8,692.75</u>

Law department:

By United States, for salaries	7,200.00
By matriculation fees and diplomas	1,172.79

To salaries of professors and lecturers	\$7,200.00
To lecturers, fuel, gas, janitor, assistant librarian, print- ing, pay of custodian of building, and all other miscel- laneous expenses	1,172.79
	<u>8,372.79</u>

Theological department:

By interest on Stone fund from American Missionary Association trustees	1,800.00
By donations through Dr. Sinclair	856.61
By special donation	10.00

To amount paid theological professors	\$2,300.00
To amount paid Dr. Sinclair, commission	285.52
To amount transferred to chapel fund by order of executive committee	71.34
To amount paid for incidental expenses	9.75
	<u>2,666.61</u>

Statement of receipts and disbursements from July 1, 1897, to June 30, 1898—Continued.

ACCOUNT PERTAINING TO CURRENT EXPENSES—continued.

EXPENSES—continued.

General endowment fund (land):

By balance on hand July 1, 1897.....	\$5,370.23
By loans paid.....	12,090.00
By payments on land.....	4,397.00
To amount invested.....	\$13,917.93
To special assessment and sewer taxes, square 1055.....	189.69
To amount transferred to current expense account.....	1,826.00
To amount paid for correction of error by order of court of equity, on settlement in relation to square 1055.....	10.42
To balance, June 30, 1898.....	5,913.19
	<hr/> 21,857.23 <hr/>

The Fred. Douglass scholarship fund:

By balance on hand July 1, 1897.....	748.16
By interest.....	225.18
By loans paid.....	500.00
To amount transferred to aid fund.....	\$229.00
To amount invested.....	1,200.00
To balance, June 30, 1898.....	44.34
	<hr/> 1,473.34 <hr/>

J. K. McLean scholarship fund:

By interest.....	60.00
To amount transferred to aid fund.....	\$30.00
To balance, June 30, 1898.....	30.00
	<hr/> 60.00 <hr/>

The W. W. Patton memorial fund:

By balance on hand July 1, 1897.....	12.10
To balance, June 30, 1898.....	12.10
	<hr/> 12.10 <hr/>

The W. W. Patton scholarship fund:

By interest.....	60.00
To amount transferred to aid fund.....	60.00
	<hr/> 60.00 <hr/>

The Mary B. Patton scholarship fund:

By balance on hand July 1, 1897.....	36.00
By interest.....	72.00
To amount transferred to aid fund.....	\$108.00
	<hr/> 108.00 <hr/>

The F. B. Schoals scholarship fund:

By balance on hand July 1, 1897.....	\$280.75
By interest.....	352.60
By loans paid.....	1,300.00
To amount transferred to aid fund.....	\$491.00
To balance, June 30, 1898.....	1,442.35
	<hr/> 1,933.35 <hr/>

The Horace Ford scholarship fund:

By balance on hand July 1, 1897.....	30.00
By interest.....	60.00
To amount transferred to aid fund.....	\$90.00
	<hr/> 90.00 <hr/>

The J. W. Alvord scholarship fund:

By balance on hand July 1, 1897.....	35.00
By interest.....	50.00
To coupon of March 1, 1897, returned unpaid.....	\$35.00
To amount transferred to aid fund.....	50.00
	<hr/> 85.00 <hr/>

The Orange Valley scholarship fund:

By interest.....	60.00
To amount transferred to aid fund.....	60.00
	<hr/> 60.00 <hr/>

Statement of receipts and disbursements from July 1, 1897, to June 30, 1898—Continued.

ACCOUNT PERTAINING TO CURRENT EXPENSES—continued.

EXPENSES—continued.

The Thad. Stevens fund:	
By interest	\$132.00
To amount paid to Dr. C. B. Purvis	132.00
<hr/>	
The J. P. Thompson scholarship fund:	
By balance on hand July 1, 1897	68.50
By interest	12.00
To amount transferred to aid fund	\$20.00
To balance, June 30, 1898	60.50
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The William E. Dodge scholarship fund:	
By balance on hand July 1, 1897	150.00
By interest	272.80
By loans paid	1,000.00
To amount invested	\$500.00
To amount transferred to aid fund	422.00
To balance, June 30, 1898	500.80
<hr/>	
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The Edward Smith text-book fund:	
By balance on hand July 1, 1897	14.15
By interest	30.00
To amount paid for students' books	\$29.15
To balance, June 30, 1898	15.00
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The Hartford reading-room fund:	
By balance on hand July 1, 1897	11.19
By interest	24.00
To amount expended	\$18.88
To balance, June 30, 1898	16.31
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The Thomas Cropper Riley scholarship fund:	
By balance on hand July 1, 1897	30.00
By interest	60.00
To amount transferred to aid fund	\$90.00
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The Andrew Rankin memorial chapel fund:	
By balance on hand July 1, 1897	572.63
By donations through agent	1,890.27
By special donations	50.00
By Sunday collections	15.37
By transfer from theological department	71.34
To agent's commission	\$619.32
To express, postage, and printing	11.31
To amount paid on account of loans	700.00
To interest on loans	186.00
To fitting up practice school in basement	248.89
To amount of special donation transferred to aid fund by request of donor	50.00
To balance, June 30, 1898	784.09
<hr/>	
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The Caroline Patton Hatch fund:	
By balance on hand July 1, 1897	12.00
By interest	6.00
By loans paid	200.00
To amount transferred to aid fund	\$18.00
To balance, June 30, 1898	200.00
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Statement of receipts and disbursements from July 1, 1897, to June 30, 1898—Continued.

ACCOUNT PERTAINING TO CURRENT EXPENSES—continued.

EXPENSES—continued.

The Martha Spaulding scholarship fund:

By balance on hand July 1, 1897.....	\$147.50
By interest	237.50
To amount transferred to aid fund.....	\$377.00
To balance, June 30, 1898.....	8.00
	<u>385.00</u>

Students' aid fund:

By balance on hand July 1, 1897.....	10.59
By amount transferred from specific funds.....	2,045.00
By loans paid by students.....	112.00
By special donations.....	60.00
By donations through agent.....	382.25
To cash paid students.....	\$2,341.19
To amount paid agent's commission	124.07
To amount transferred to deposit account for prizes.....	100.00
To balance, June 30, 1898.....	44.58
	<u>2,609.84</u>

Deposits:

By cash received for safe-keeping	770.99
To cash paid depositors	\$651.03
To balance, June 30, 1898*	119.96
	<u>770.99</u>

The alumni professorship fund:

By balance on hand July 1, 1897.....	25.00
To balance, June 30, 1898.....	25.00

Theological alumni fund:

By balance on hand July 1, 1897.....	10.00
By donations	17.56
To balance, June 30, 1898	27.56

Boarding account:

By cash, for board	4,042.05
To cash paid boarding hall committee	\$4,041.20
To balance, June 30, 1898.....	.85
	<u>4,042.05</u>

List of permanent funds.

Name of fund.	June 30, 1898.		Total.
	Cash invested.	Cash on hand.	
General endowment fund (land).....	\$119,891.27	\$5,913.19	\$125,804.46
Martha Spaulding scholarship fund.....	7,000.00		7,000.00
Douglass scholarship fund	4,353.00	44.16	4,397.16
McLean scholarship fund	1,000.00		1,000.00
W. W. Patton memorial fund.....		12.10	12.10
W. W. Patton scholarship fund.....	1,000.00		1,000.00
M. B. Patton scholarship fund.....	1,200.00		1,200.00
Horace Ford scholarship fund	1,000.00		1,000.00
J. W. Alvord scholarship fund	1,000.00		1,000.00
Orange Valley scholarship fund.....	1,000.00		1,000.00
F. B. Schoals scholarship fund	4,800.00	1,400.00	6,000.00
J. P. Thompson scholarship fund.....	200.00	60.00	260.00
Wm. E. Dodge scholarship fund.....	4,500.00	500.00	5,000.00
Thos. Cropper Riley scholarship fund.....	1,000.00		1,000.00
Edward Smith text-book fund.....	500.00		500.00
Hartford reading-room fund.....	400.00		400.00
Thad. Stevens fund	2,200.00		2,200.00
Caroline Patton Hatch fund.....		200.00	200.00
Alumni professorship fund		25.00	25.00
Theological alumni fund		27.56	27.56
Total.....	150,844.27	8,182.01	159,026.28

* Of this balance \$100 is to be given for prizes to be awarded by the college faculty in September, 1898.

RECAPITULATION.

Account.	Balance on hand July 1, 1897.	Received.	Disbursed.	Balance on hand June 30, 1898.
Account pertaining to current expenses of academic branches, officers, and professors.....	\$135.86	\$40,993.02	\$41,128.32	\$0.06
Medical department.....	25.25	8,667.50	8,666.46	26.29
Law department.....		8,372.79	8,372.79	
Theological department.....		2,666.61	2,666.61	
General endowment fund.....	5,370.23	16,487.00	15,944.04	5,913.19
F. Douglass scholarship fund, principal.....	744.16	500.00	1,200.00	44.16
F. Douglass scholarship fund, interest.....	4.00	225.18	229.00	.18
J. K. McLean scholarship fund, interest.....		60.00	30.00	30.00
Wm. W. Patton memorial fund, principal.....	12.10			12.10
Wm. W. Patton scholarship fund, interest.....		60.00	60.00	
Mary B. Patton scholarship fund, interest.....	36.00	72.00	108.00	
F. B. Schoals scholarship fund, principal.....	100.00	1,300.00		1,400.00
F. B. Schoals scholarship fund, interest.....	180.75	352.60	491.00	42.35
Horace Ford scholarship fund, interest.....	30.00	60.00	90.00	
J. W. Alvord scholarship fund, interest.....	35.00	50.00	85.00	
Orange Valley scholarship fund, interest.....		60.00	60.00	
Thad. Stevens fund, interest.....		132.00	132.00	
J. P. Thompson scholarship fund, principal.....	60.00			60.00
J. P. Thompson scholarship fund, interest.....	8.50	12.00	20.00	.50
Wm. E. Dodge scholarship fund, principal.....		1,000.00	500.00	500.00
Wm. E. Dodge scholarship fund, interest.....	150.00	272.80	422.00	.80
Smith text book fund, interest.....	14.15	30.00	29.15	15.00
Reading room fund, interest.....	11.19	24.00	18.88	16.31
Thos. Cropper Riley scholarship fund, interest.....	30.00	60.00	90.00	
Andrew E. Rankin chapel fund.....	572.63	2,028.98	1,815.52	784.09
Caroline Patton Hatch fund, principal.....		200.00		200.00
Caroline Patton Hatch fund, interest.....	12.00	6.00	18.00	
Martha Spaulding scholarship fund, interest.....	147.50	237.50	377.00	8.00
Students aid.....	10.59	2,599.25	2,566.26	44.58
Deposits.....		770.99	651.03	119.96
Alumni professorship fund, principal.....	25.00			25.00
Theological alumni fund.....	10.00	17.56		27.56
Board.....		4,042.05	4,041.20	.85
Total.....	7,724.41	91,357.83	89,811.26	9,270.98

COLUMBIA INSTITUTION FOR THE DEAF AND DUMB.

OFFICERS OF THE INSTITUTION.

Patron.—William McKinley, President of the United States.

President.—Edward Miner Gallaudet, Ph. D., LL. D.

Secretary.—Hon. John B. Wight.

Treasurer.—Lewis J. Davis, esq.

Directors.—Hon. Francis M. Cockrell, Senator from Missouri; Hon. Sereno E. Payne, Member of Congress from New York; Hon. Joseph D. Sayers, Member of Congress from Texas, representing the Congress of the United States; Hon. Henry L. Dawes, of Massachusetts; Hon. Joseph R. Hawley, of Connecticut; Rev. Byron Sunderland, D. D.; Hon. John W. Foster, Hon. William L. Wilson, of Virginia; Lewis J. Davis, esq.

FACULTY OF GALLAUDET COLLEGE.

President and professor of moral and political science.—Edward Miner Gallaudet, Ph. D., LL. D.

Vice-president and professor of history and languages.—Edward A. Fay, M. A., Ph. D.

Emeritus professor of mental science and English philology.—Samuel Porter, M. A.

Professor of natural science.—Rev. John W. Chickering, M. A.

Professor of history and English.—J. Burton Hotchkiss, M. A.

Professor of mathematics and Latin.—Amos G. Draper, M. A.

Professor of mathematics and chemistry.—Charles R. Ely, M. A.

Assistant professor of mathematics.—Percival Hall, M. A.

Instructor in English.—May Martin, B. A.

Instructor in English and Latin.—Allan B. Fay, M. A.

Instructors in gymnastics.—Albert F. Adams, B. A.; Clara J. Horton.

Instructor in drawing.—Arthur D. Bryant, B. Ph.

DEPARTMENT OF ARTICULATION.

Professor in charge.—Percival Hall, M. A.

ASSISTANTS.

Instructors.—Mary T. G. Gordon, Kate H. Fish, Allan B. Fay, M. A.

Normal fellows.—Arnold H. Payne, B. A., Jesus College, Oxford; Arnold Shreve, B. A., University of Nebraska; Frances K. Bell, M. S., Synodical College, Mo.; Alvin E. Pope, B. A., University of Nebraska.

Normal students.—Louise S. Robinson, Portland (Me.) High School; Hattie Marshall Bear, Mary Baldwin Seminary, Staunton, Va.

FACULTY OF THE KENDALL SCHOOL.

President.—Edward Miner Gallaudet, Ph. D., LL. D.

Instructors.—James Denison, M. A., principal; Melville Ballard, M. S.; Theodore A. Kiesel, B. Ph.; Sarah H. Porter; May Martin, B. A.

Instructors in articulation.—Mary T. G. Gordon, Kate H. Fish.

Instructor in drawing.—Arthur D. Bryant, B. Ph.

DOMESTIC DEPARTMENT.

Supervisor and disbursing agent.—Wallace G. Fowler.

Attending physician.—D. K. Shute, M. D.

Consulting physician.—N. S. Lincoln, M. D.

Matron.—Miss Ellen Gordon.

Associate matron.—Mrs. Amanda W. Temple.

Master of shop.—Isaac Allison.

Farmer and head gardener.—Edward Mangum.

FORTY-FIRST ANNUAL REPORT

OF THE

COLUMBIA INSTITUTION FOR THE DEAF AND DUMB.

COLUMBIA INSTITUTION FOR THE DEAF AND DUMB,
Kendall Green, Washington, D. C., October 4, 1898.

The pupils remaining in the institution July 1, 1897, numbered 103; admitted during the year, 41; since admitted, 40; total, 184. Under instruction since July 1, 110 males; females, 74. Of these, 127 have been in the college department, representing 28 States, the District of Columbia, and Canada, and 57 in the primary department. A list of the names of the pupils connected with the institution since July 1, 1897, will be found appended to this report.

HEALTH.

The great convenience and value of our hospital rooms, which were provided in our new dormitory, were again made evident during the past year. One case of typhoid fever, having its origin outside of our premises, and several cases of measles were treated most comfortably and successfully. With these exceptions, good health has prevailed throughout our large household during the year.

DEATH OF THE HON. EDWARD C. WALTHALL.

The management of the institution has sustained a severe loss during the past year in the death of the Hon. Edward C. Walthall, a member of the Senate of the United States from Mississippi, who was appointed a member of the board by the President of the Senate in 1886.

At a meeting held on the 3d of May the following minute was adopted by the board:

In the death of the Hon. Edward C. Walthall, lately a Senator of the United States from Mississippi, and a member of the board of directors of the Columbia Institution for the Deaf and Dumb, by appointment of the President of the Senate, the management of the institution has sustained a loss that will be keenly felt so long as one remains on the board of those who have been his associates. For Senator Walthall possessed in a remarkable degree those qualities of mind and disposition that command not only the esteem but the warm appreciation of men.

Always courteous and kind, generous and fair, he spoke ill of none, not even of those he felt compelled to antagonize.

In the counsels of the institution he was invariably liberal and progressive, ready for new measures so soon as the wisdom of their adoption was made apparent, and always full of sympathy for those for whose benefit the institution was established. No man could discharge more fully and conscientiously, or with greater personal interest, the duties of a director than did Senator Walthall.

COURSE OF INSTRUCTION AND LECTURES.

No essential change has taken place in the general course of instruction since 1887, when in our thirtieth report a detailed statement of the branches taught in both school and college was published. During the year special lectures have been given as follows:

In the college:

Diseases of the Body Politic, by President Gallaudet.
Farthest North, by Professor Fay.
Across the Continent, by Professor Chickering.
The Cosmogony of Dante's Paradiso, by Professor Porter.
Trial by Ordeal, by Professor Hotchkiss.
Preparation for Business in College, by Professor Draper.
Chemistry in Everyday Life, by Professor Ely.
University Settlements, by Mr. Hall.

In the Kendall School:

The Story of Bathmendi, by Mr. Denison.
Highways of Commerce, by Mr. Ballard.
Empress Josephine, by Mr. Kiesel.
Gen. Daniel Morgan, by Mr. Bryant.
The Merchant of Venice, by Mr. Driggs.
Honor to Parents, by Mr. Henne.
Old Times in the West, by Mr. White.
Gulliver's Travels, by Mr. Peterson.
The Boyhood of U. S. Grant, by Mr. Zahn.
Little Lord Fauntleroy, by Mr. Rothert.

INSTRUCTION IN SPEECH.

Daily instruction in speech and speech reading was given by experienced teachers to all pupils of the Kendall School who showed any signs of improvement. Auricular work was carried on with three of the pupils by one of the normal students with considerable success. A section of one class recited its lessons orally every day. The time of instruction of all the classes in articulation was lengthened.

In the college, daily drill in very small classes was offered to all students, and about 80 per cent were glad to avail themselves of the opportunity to preserve and improve their speech.

The work was carried on by four regular teachers, with the aid of the five members of the normal class, in a successful manner. Auricular training was given to six students, five of whom were able to use their power of hearing to a considerable extent in everyday life.

Many of the students of the college recited orally in their class work.

THE NORMAL DEPARTMENT.

The members of the normal class, five in number, completed the usual course satisfactorily. They were given a knowledge of the sign language, the manual method, thorough instruction in speech teaching, and practice in teaching both orally and by means of the manual alphabet and signs. The young men were required to conduct chapel exercises and to give lectures in signs to pupils of the Kendall School. They met and discussed various well-known methods of teaching among themselves, and, in short, prepared themselves to enter into any school as capable teachers.

At the end of the year the class presented theses on "A method of educating congenitally deaf children."

All the members of the class have secured eligible positions as teachers of the deaf.

EXERCISES OF PRESENTATION DAY.

The annual public exercises of the college took place on Wednesday, the 4th day of May.

The Rev. Wallace Radcliffe, D. D., pastor of the New York Avenue Presbyterian Church, offered the opening prayer.

The essays of the graduating academic class were as follows:

Orations.—The Measure of a Man, Peter N. Peterson, Minnesota; Colorado, Sarah M. Young, Colorado; Taste, Helena R. Leyder, Illinois; Love of Home, Lilla E. McGowan, Iowa; What's in a Name? Clara Runck, Ohio; What is True Americanism? Robert Zahn, Kentucky; Hero Worship, Arlington J. Eickhoff, Michigan.

Dissertations.—Modern Journalism, Waldo H. Rother, Iowa; Laconics, Robert L. Erd, Illinois; The Evils of War, George E. Fister, Pennsylvania; The Lost Atlantis Found Again, Benjamin F. Jackson, Illinois; Flowers, May E. Stemple, Pennsylvania.

Candidates for degrees and certificates recommended by the faculty were presented to the board of directors as follows:

For the degree of master of arts (normal fellow).—Cyrus E. White, B. A., Penn College, Iowa.

For the degree of bachelor of arts.—Arlington Jacob Eickhoff, Robert Louis Erd, Helena Rose Leyder, Lilla Edith McGowan, Peter Niklas Peterson, Waldo Henry Rother, Clara Runck, May Evelyn Stemple, Sarah Maria Young, Robert Zahn.

For the degree of bachelor of science.—George Elwood Fister.

For the degree of bachelor of philosophy.—Benjamin Franklin Jackson.

Normal students, 1897-98.—Frank Milton Driggs, University of Utah; Ezra Stephen Henne, Michigan State Normal School; Edith Baker Pyle, St. John's School, New York; Laura Carroll Wing, Cutler Academy, Colorado.

The degree of master of arts, in course, was conferred on Harry Van Allen, B. A., 1886; Henry Gross, B. A., 1888, and Oscar H. Regensburg, B. A., 1890.

REMARKS OF PRESIDENT GALLAUDET.

Before introducing those of the graduating class who were to take part in the exercises, the president of the college spoke as follows:

We have received from the President of the United States a very cordial greeting and a note expressing his great regret that his arduous duties make it impossible for him to be with us. He expresses very great interest in the work of the college.

The Vice-President also sends me a note in which he expresses his very great desire to be present and his hope that he may be, but some uncertainty as to whether he will be able to do so.

The Secretary of the Interior, through whom the institution makes its reports to Congress and derives its funds from Congress, expected to be here until yesterday afternoon, when he received an unexpected summons to go to New York. He sends a note expressing his great regret.

Before introducing the young people of our college who are to take part in the exercises of the afternoon I would like to say, for the information of our friends who have honored us with their presence, that they must not infer, because a majority of these young people speak by gestures, that they have not the power of speech.

You are all aware that of late years great attention has been given in this country to the teaching of speech to the deaf. All of the twelve young people of our present graduating class are able to speak more or less. A few of them came to us without any power of speech, and with the instruction we have been able to give them are able now to speak to a very considerable extent. Others who had the power of speech before coming here have improved that power under our instruction, and several of them would be able to speak their essays, but their voices are not sufficiently strong and vigorous to be heard throughout the hall. It is therefore thought better, that their essays may be well understood by the audience, that they should be read by the professors and the students themselves use the sign language. One, however, the valedictorian of the class, will give his oration wholly by speech.

After the presentation of the candidates for degrees, President Gallaudet spoke as follows:

Few names are more illustrious or more honored than that of De l'Epée. Not only in France, but in America, is he looked upon as the saint of deaf-mute education. In the year 1760 he established the first school that became permanent for the education of the deaf in France. His method was one which was based upon the language natural to the deaf—that of gestures. He gave his pupils a high degree of intellectual, moral, and religious training. His work was successful in an eminent degree. The institution which he established exists to-day highly prosperous, and many schools in France and in other countries are now doing a great and noble work in the education of the deaf, all of which may trace their origin to the work of De l'Epée.

Among the deaf the name of De l'Epée is especially honored. Monuments exist of him, in Paris associations are named for him, and the deaf honor his memory in many ways.

It is of interest to American students to know that the work of teaching the deaf in this country was begun by a gentleman who was the pupil of the immediate successor of De l'Epée, that eminent French teacher of the deaf and dumb, Sicard.

With an eminent pupil of Sicard he returned to this country equipped with the knowledge necessary to the establishing of the first school, which was opened more than eighty years ago at Hartford, Conn.

In this country we possess what is termed the combined system, which unites both of the methods of educating the deaf—the manual and the oral. In France—and I say it with much regret—the method of De l'Epée has to a great degree fallen into disuse. It has been superseded by methods introduced from Italy and Germany, and this is a cause of deep regret to the highly educated deaf of France.

It was my pleasure last year to make a trip to Europe largely for the purpose of meeting with the educated deaf mutes of the Continent and learning from them their opinions as to methods. I received in France a most cordial and enthusiastic reception from the educated deaf, who were pleased to greet me as the representative of the system which preserves in America the essential features of the method of De l'Epée; and these deaf mutes, highly educated as they are, expressed an earnest hope that in the future the schools of the deaf in France might in a measure return to the methods of De l'Epée, not abandoning the methods of speech, but adding the other method, while retaining the language of gestures—that language which is natural to the deaf.

So, after my return to this country, I received a communication from the deaf of France to ask if I would accept as a testimonial of their regard for my being the champion of the combined system of instruction, the system which combines and shapes all methods into one—whether I would accept the bust of De l'Epée, made by the deaf-mute sculptor, Felix Plessis, as a testimonial of their regard. Of course I replied that I would accept the gift with pleasure and feel it to be a great honor. So they immediately started a popular subscription among the deaf and purchased the bust, which was forwarded to me.

It is a work of great merit. It is colossal in size. It is really too large to have a place in a private house, and I consider that as it was presented to me rather as the representative of the college than as an individual, I should present it to the college as a work of art to adorn this hall. I therefore take this occasion to offer it as a gift to the college.

I know that it will be a source of great satisfaction to all here assembled that his excellency the French ambassador, M. Jules Cambon, has honored us with his presence to-day. I am sure that we all unite in warmest greetings to our loved sister country, France, who was so much to us in the Revolution, and with whom our associations have been so intimate in the matter of the education of the deaf.

At this point of the proceedings two young ladies of the college unveiled the bust of De l'Epée by removing the American and French flags with which it had been covered. Great applause followed.

The French ambassador then came forward and spoke in French as follows, his address being interpreted through the language of signs by Professor Fay:

ADDRESS OF THE FRENCH AMBASSADOR.

LADIES AND GENTLEMEN: I am obliged to speak to you in French, and I hope you will not take this amiss, for in a ceremony like the present, consecrated to the memory of one whom France holds in highest honor, it is, perhaps, not inappropriate that a few words should be spoken in French.

Dr. Gallaudet has just told you of the extent of the labors and the services of the Abbé de l'Épée. I need not repeat. It is a great satisfaction to me to see such homage rendered to the benevolent man who has lifted from the depths of the misery and ignorance consequent upon their infirmity so many poor and neglected children. His work has been followed in all countries, and in none with greater success than in America.

It can be truly said that France and America are animated by the same love of humanity.

Just now the bust of De l'Épée was concealed from our eyes by the flags of two nations—two flags not precisely alike, but which resemble each other in this, that they present the same colors differently arranged—blue, white, and red. One may say the same as to the differences of manners, traditions, and conditions of life in our two countries. The same generous sentiments animate the hearts of both.

France is, moreover, doubly interested in this ceremony. If, as has been said, the Abbé de l'Épée, whom you honor to-day, one of my compatriots, gave the tree of life to be transplanted hither, those in whose care it was to fructify in American soil can not be regarded as foreigners to France, for their ancestors came from France two centuries ago, and Dr. Gallaudet permits me to remember that the best old blood of France courses in his veins.

Better than any spoken words, this touching ceremony shows that there is a common ground on which men of feeling, to whatever country they belong, are sure to meet—that of benevolence. In the future, as in the past, may our two flags float always together for the advancement of civilization and the relief of the unfortunate.

The president then introduced Hon. D. B. Henderson, of Iowa, as one who had on many occasions shown himself a friend of the college, and especially interested in the present exercises, since two of the graduating class were from Iowa.

ADDRESS OF THE HON. DAVID B. HENDERSON.

Members of the Faculty, Friends of this Institution, and Ladies and Gentlemen of the Graduating Class: This is an occasion of exquisite pleasure and of extreme pain to me—pleasure because I see that progress of education, intelligence, and love of humanity are lifting the unfortunate ones of our human family from the depth of sorrow to an equal plane of enjoyment with all, and pain because you are of the unfortunate of earth. But, my young friends, you are not alone in this world in having a trouble or troubles. The bard who has most surely and sweetly sung the sorrows of mankind, Robert Burns, in his sweetest and truest song tells us that "man was made to mourn." There is a place in every human soul where a skeleton of some kind exists. The emperor upon his throne trembles for fear of the assassin. The soldier, of whom my young friend spoke so eloquently, has something to face besides glory. I care not how manly the form may be, somewhere in that fine physique is the seed of suffering, and there are greater sufferings than physical ones—sufferings of the human mind, of the human heart. Show me a human being and I will show you where sorrow dwells.

I read in history that a time was when those suffering as you have suffered were thought only fit for death, and back in the dark ages the deaf and dumb were cruelly disposed of. It was even contended by scientists and great physicians and the best educators of ancient times that there was no way to cultivate the mind of the deaf and dumb, the contention being that only through hearing could the mind be cultivated. Let me give you a line from Lucretius showing the doctrine:

To instruct the deaf no art could ever reach,
No care avail them and no wisdom teach.

What a horrible darkness we have compassed. Should not this world be grateful to the great Abbé and his greater followers?

But you are not all sorrow, my dear young friends. In this very city I went to make a call at a private house where some friends of mine were stopping. I was ushered into the sitting room to wait for my card to be answered. I looked around and saw a splendid looking young man with a beautiful girl sitting on a sofa beside him. Rosy-lipped, bright-eyed, fresh-faced was the maiden; and the lounge was not a very long one, either. They did not seem to think that I was there, and they were going on in this peculiar way (making gestures), and all that sort of thing, and the young man, I could see—and I do not know any of this deaf and dumb business—the young man was saying something that was very precious to the young woman, and the young woman was taking it in in double doses with all her heart and soul. They understood each other perfectly, and I understood a great deal of it too; and yet to think that the greatest teachers of science, doctors, and philosophers of that time said you could not teach the deaf and dumb anything except to die!

A staggering drunkard is an object lesson to the eye; a manly man is a lesson to every eye; the tender smiling eye of a mother is at once a sermon and a poem; and yet these ancient philosophers contended that only through the ear could man be educated.

Now, let us see how things are. I find by statistics that in this country of those unable to hear a loud conversation and who are unable to speak there are—how many, do you think? An army of 121,178. Of that number there are those who can not speak a single word, 80,000; of that 80,000 there are females unable to speak, 31,338. What a temptation for cross old bachelors who want to do all the talking! The Rev. Mr. Gallaudet told me a few moments ago that he, like his father, married a woman who can not speak, and I am inclined to think that he did so because he wanted to do all the talking himself.

In this connection a fact attracted my attention, my dear young friends, that, while there are 80,000 in this country totally dumb, there are 50,568 in the United States who are totally blind in both eyes. You can pray to your Maker and bless Him because you are not of these unfortunates; of those who can not see the face of love or trace the sweet smiles of a mother or a child; to whom is shut out the sight of the skies and parks and fields and flowers. That is something terrible to suffer. And yet there is a sweet law of compensation that touches every human soul, and some of my dearest friends who are sightless, I find, have ways of enjoyment, too; the hearing becomes quicker, the touch fuller of life, or in some other way God pours sunshine into their souls.

Looking at the matter of education to which I have referred, I am very much impressed with something that I have picked up. I am grateful to this wonderful man, your president, for having asked me, for having given me this place of honor to address you. While in a general way I understood what your school was doing, it was not until yesterday, when I made the great Congressional Library turn out its stock of books and sat down among them that I found I was in dense ignorance of this great work—of the whole history of those afflicted souls.

The very first instance of an attempt to teach them was in 685 A. D., after an investigation of the subject as to whether they had souls. Again in the fifteenth century the first real investigation took place, and not until the seventeenth century did the sceptics begin to weaken and realize that these unfortunates of ours could be made and should be a part of the human family. Prior to the year 1800 there had struggled into existence just 8 institutions for educating the deaf and dumb—for the entire world only 8. Now, in 1882 there were 375 institutions of that kind in the world, and in the United States 65; and in 1891 I find that there were 73 in the United States; and the pupils like you, my young friends, in these schools in the United States in 1891 numbered 8,000. In 1882 the total was 2,197. What can you do? That is the question now for you.

I read the motto of your class: "The end crowns the work." When is the end? You have only had a touch of the book or the painter's brush. You, young man, have only had your hands put to the plow handle. The end is not in sight. You are simply equipped with the power to go to work. Only a short time ago a friend, of my own town, graduated here, and he has now a wholesale business, carrying on the wholesale rubber business. I was going to send him a civil-service blank to get him into the Government service, but he sent word back to me that he had a better thing. I know another who has a wife and babies and who is an active worker in the Smithsonian Institution, and who is a man in whose presence I feel that I ought to take my hat off all the time.

Now, I have looked over the great work concerning your lives. We have here an illustration that minds can be developed in the deaf and dumb. Here is a man who nearly all his life has been preaching to the deaf and dumb, the brother of your honored president, and another was mentioned this afternoon by the president, and I find by the census and from other sources of information that the deaf and dumb become farmers successfully. I name them first—and I am not now speaking as a politician, but as a statesman—they should be placed at the head of all the learned professions. Then, the deaf make splendid mechanics. They have reached the front rank as scientists. In literature they have become known and honored, and—would you believe it?—they have become successful lawyers; not liars, but lawyers. They have been successful in the arts. We have an instance before us in that splendid bust of the immortal Abbé that they can become great sculptors. They make fine journalists, and ah, how rapidly they can trace their thoughts on paper!

And right here let me call attention to one thing that I noticed this afternoon. I want to express my gratification to this splendid class of young men and young women that something or other in your misfortune seems to close your eyes and seal your lips to scandal. Not a single one of your papers this afternoon, not even that of my young friend who went wandering with the gods of war, that had aught of cunning or baseness. Every thought was lofty. No kicking—I use that term as a

statesman. Every paper that was read this afternoon was elevated; and I wonder if it is true that when God lays a weight on a human soul that that weight crushes a meanness out of that human heart. Your papers and conduct this afternoon have suggested that thought.

Bless you, they make good citizens of the Republic, the highest point that can be reached. Do not despair, my young friends, you have a gift of your own that is wonderful. I have seen some strange and wonderful things in my life, and I am only a kid, as you can see; but you saw your professor translate the words of the French ambassador with the easy grace and accuracy which you all realize, and you learn from the lips of your honored president that when traveling abroad in different lands that which he used was a common language, and they could all understand. It makes me feel as if it might be better if the whole world were struck deaf and dumb, so that the world might be made akin and we could all understand each other.

Remember how John Milton, blind at 44 years of age, gave this world through his writings more of heaven and hell than most people gather from the books of the inspired writings. He wrote all of *Paradise Lost* after he was blind, and all of *Paradise Regained*, his wonderful work of Samson, and that still more wonderful work, his *Defense of the English-Speaking People*. There is a star of hope above for every human soul, no matter what his misfortune may be.

In my examination of the numerous books that Assistant Librarian Spofford was kind enough to send over yesterday at my request I find the name of Gallaudet recognized by every authority, the father of these wonderful men—the father of these two men who in this country blazed the way for the education of the deaf and dumb. In the preface of one able writer I was delighted to find these sentences: “He was, I believe, the founder of the great institution at Hartford, Conn., really the first institution of any importance in this country for the improvement of the condition of the deaf and dumb. This was founded in May, 1817.” That is before you and I were born. “The kindness and unwearied”—what a well-chosen word, unwearied—“attention of the Rev. Mr. Gallaudet has left upon his pupils an impress which time can never efface.”

My young friends, you go forth to the battle of life with the consciousness that you have graduated and received your instruction from the first college in the world that teaches the deaf and dumb, and that you have had impressed upon your brains and in your hearts teachings from the great living master of the science, the president of this college. I congratulate you, and I wish you every success in the great battle of life which you are just commencing.

The exercises of the afternoon were closed with the benediction by the Rev. Thomas Gallaudet, D. D., rector emeritus of St. Ann's Church for Deaf Mutes, New York.

Degrees were conferred at the close of the term in accordance with the recommendations of presentation day, excepting in the cases of Mr. Fister, of Pennsylvania, and Mr. Jackson, of Illinois, both of whom received the degree of bachelor of arts. Eight pupils were graduated from the Kendall School at the end of the school year.

RECEIPTS AND EXPENDITURES.

The receipts and expenditures for the year under review will appear from the following detailed statements:

SUPPORT OF THE INSTITUTION.

RECEIPTS.

Balance from old account....	\$11. 33	Manual-labor fund	\$114. 21
From the Treasury of the		Old metal sold	8. 00
United States	65,000. 00	Shoe repairs	14. 35
Board, tuition, and room rent.	5,190. 50		
Work in shop	7. 55	Total	70,345. 94

EXPENDITURES.

Salaries and wages.....	\$38,529.10	Plants, seeds, tools, etc.....	\$120.09
Miscellaneous repairs.....	1,832.01	Blacksmithing.....	146.96
Household expenses, market- ing, etc.....	3,578.94	Ice.....	511.79
Meats.....	5,837.39	Carriage and carriage repairs.....	324.75
Groceries.....	2,993.82	Manure.....	213.60
Bread.....	1,961.87	Live stock.....	1,389.25
Butter and eggs.....	1,873.68	Harness and harness repairs.....	109.00
Medical attendance and nurs- ing.....	509.89	Incidental expenses.....	286.81
Telephone and electric clocks.....	180.31	L. J. Davis, treasurer.....	800.00
Furniture.....	546.83	Crockery, etc.....	252.35
Lumber.....	141.42	Stamped envelopes.....	43.60
Dry goods.....	558.44	Auditing accounts.....	300.00
Gas.....	1,132.30	Gymnasium apparatus.....	14.31
Paints, oils, etc.....	189.00	Printing, etc.....	262.52
Fuel.....	2,773.54	Expenses of directors' meet- ings.....	35.50
Feed.....	847.40	Entertainment of pupils.....	50.00
Medicines and chemicals.....	573.59	Lectures.....	125.00
Books, stationery, and school apparatus.....	754.48	Balance.....	296.58
Hardware.....	249.82	Total.....	70,345.94

SPECIAL REPAIRS.

Received from the Treasury of the United States..... \$3,000.00

EXPENDITURES.

Steam heating.....	\$1,019.48
Painting.....	302.45
Increasing water supply.....	974.44
Plumbing and sewerage.....	564.31
Labor, etc.....	139.32
Total.....	3,000.00

ESTIMATES FOR NEXT YEAR.

The following estimates for the fiscal year ending June 30, 1900, have already been submitted:

For the support of the institution, including salaries and incidental expenses, for books and illustrative apparatus, and for general repairs and improvements, \$67,000.

For repairs to the buildings of the institution, including plumbing and steam-heating apparatus and for repairs to pavements, \$3,000.

MEDALS FROM THE COLUMBIAN EXPOSITION.

In our thirty-seventh report the fact was stated that awards had been made to the institution by the World's Columbian Commission:

The diplomas and medals have been received, and the awards are as follows:

TO THE COLLEGE—AWARD.

First, the model of the statue representing the elder Gallaudet teaching his first deaf-mute pupil symbolizes the beneficent introduction of the deaf-mute education in America; second, the college is the only institution giving this advanced grade of instruction to deaf-mutes in the world; third, for evidence of good attendance, thorough work, and excellent results in preparing deaf-mutes for success as writers, editors, lawyers, architects, and teachers, as well as skilled artisans in various industries.

TO THE KENDALL SCHOOL—AWARD.

Shows evidence of a well-equipped deaf-mute school for manual, elementary, and secondary instruction. Articulation and lip reading are given constant and careful attention.

NATIONAL EDUCATIONAL ASSOCIATION.

The subject of deaf-mute education received special consideration at the convention of the National Educational Association, which was held in Washington last July.

The president of this institution, on the invitation of President Greenwood, of the association, delivered an address on "The deaf and their possibilities" at a general meeting of the association held in the National Theater on the evening of July 11.

Department sixteen of the association, formed to give attention to the education of the deaf, the blind, and the feeble-minded, occupied the Franklin School building with exhibits of methods of instruction, specimens of work, text-books, illustrative apparatus, etc.

Two public meetings of the section were held, which were attended by a number of the teachers and officers of our institution.

These meetings were presided over by Prof. Joseph C. Gordon, superintendent of the Illinois Institution for the Deaf and Dumb, for many years a member of our college faculty.

The members of the section visited Kendall Green in a body, on invitation, and inspected the buildings and grounds.

CONVENTION OF INSTRUCTORS AT COLUMBUS, OHIO.

The fifteenth meeting of the Convention of American Instructors of the Deaf was held at the Ohio Institution for the Deaf and Dumb, Columbus, from July 28 to August 2 inclusive.

This institution was represented by its president, Professor Fay, and Mr. Hall, of the college faculty, and Mr. Ballard of the faculty of the Kendall School.

The attendance upon the convention was large, all sections of the country being represented, as well as all the various methods of instruction.

Delegates were also present from England, Scotland, and Ireland, who brought greetings of the most friendly character from the mother country.

Valuable papers were presented, the reading of them being followed by interesting discussions.

The president of this institution, who is also president of the convention, made an address in which he condemned in a most earnest manner the infliction of the spoils system on State schools for the deaf. He spoke of a number of States in which this policy had been recently pursued by all the political parties, and pointed out the evils which inevitably followed such a course.

All of which is respectfully submitted by order of the board of directors.

EDWARD M. GALLAUDET,
President.

Hon. C. N. BLISS,
Secretary of the Interior.

CATALOGUE OF STUDENTS AND PUPILS—Continued.

IN THE COLLEGE—continued.

Ohio—Continued.

John F. Flick.
Wilhelm F. Schneider.

Pennsylvania:

May E. Stemple.
George E. Fister.
Sadie E. Griffiths.
Emma M. Prager.
Margaret M. Toomey.
John S. Fisher.
Daniel E. Moran.
Samuel Nichols.
Belle Stout.
Milton T. Haines.
Cyril A. Painter.
Charles N. Snyder.
Sarah Goldstein.
Nellie V. Hayden.
Adelaide L. Postel.
Guy P. Allen.
Ernest R. Cowley.
James K. Forbes.
Scott Foreman.

South Carolina:

Sarah Antoinette Rogers.
Charlotte M. Croft.
Theresa E. Gaillard.
William John Geilfuss.

South Dakota:

Marion E. Finch.

Tennessee:

Walter B. Rosson.
Lester G. Rosson.
John H. Ownbey.

Texas:

George Albert Brooks.
William Henry Davis.
Andrew D. Hodges.
Joseph C. Harvin.
Lettie R. Webster.

Utah:

John H. Clark.
Elizabeth De Long.

Vermont:

Albert S. Heyer.
Menegle P. Beausoliel.

Virginia:

Stephen C. Jones.

District of Columbia:

Roy James Stewart.

Canada:

John A. Braithwaite.
Alexander David Swanson.
Margaret Hutchinson.

IN THE PRIMARY DEPARTMENT.

Females.

Annie E. Bennett, Delaware.
Emily Lucile Bennett, District of Columbia.
Florence Brown, District of Columbia.
Bertha Conaway, Delaware.
Sarah L. Bailey, District of Columbia.
Maggie Dougherty, Delaware.
Rosa Early, District of Columbia.
Mattie Hurd, Delaware.
Margaret Hutchinson, Canada.
Tina F. Jones, Delaware.
Carrie King, District of Columbia.
Ida May Littleford, District of Columbia.
Caroline E. Moran, District of Columbia.
Mary O'Rourke, Delaware.
Evalyne G. Plumley, Delaware.
Gertrude Price, District of Columbia.
Mary Spurry, Delaware.
Sophia Stansbury, District of Columbia.
Carrie Strong, District of Columbia.
Sadie E. Talbert, District of Columbia.
Maggie Vaughn, District of Columbia.
Rebecca Weil, Georgia.
Viola Weil, Georgia.
Alice Woolford, District of Columbia.

Males.

Grey G. Barham, Louisiana.
Culmer Barnes, New York.
Menegle P. Beausoliel, Vermont.
Howard Breeding, Delaware.
Charles Butler, District of Columbia.
Frank Carroll, District of Columbia.

Males—Continued.

John F. Caslow, District of Columbia.
James Dogan, District of Columbia.
Hugh Dougherty, District of Columbia.
Paul Erd, Illinois.
Jacob Eskin, District of Columbia.
Ernest Foskey, Delaware.
William A. Heagie, Indiana.
Adam S. Hewetson, California.
Frank A. Johnson, Illinois.
Raymond Johnson, District of Columbia.
George E. Keyser, District of Columbia.
Robert M. Kleberg, Texas.
Aaron Lee, District of Columbia.
Charles Lee, District of Columbia.
Andrew Leitch, Ireland.
William Lowell, District of Columbia.
Samuel H. Lynn, Tennessee.
Charles Nailor, District of Columbia.
Joseph L. Norris, Virginia.
Carl Rhodes, District of Columbia.
George Richardson, District of Columbia.
Joseph P. Riley, District of Columbia.
William J. Riley, District of Columbia.
Harry Stansbury, District of Columbia.
John Shields, District of Columbia.
George Smith, District of Columbia.
Arthur L. Swarts, Delaware.
James Thomas, District of Columbia.
Richard T. Thomas, District of Columbia.
John W. Thrailkill, Missouri.
Henry Turner, District of Columbia.
Frank Winter, District of Columbia.
William W. Worley, Tennessee.

REGULATIONS.

I. The academic year is divided into three terms, the first beginning on the Thursday before the last Thursday in September and closing on the 24th of December; the second beginning the 2d of January and closing the last of March; the third beginning the 1st of April and closing the Wednesday before the last Wednesday in June.

II. The vacations are from the 24th of December to the 2d of January, and from the Wednesday before the last Wednesday in June to the Thursday before the last Thursday in September.

III. There are holidays at Thanksgiving, Washington's Birthday, Easter, and Decoration Day.

IV. The pupils may visit their homes during the regular vacations and at the above-named holidays, but at no other time, unless for some special, urgent reason, and then only by permission of the president.

V. The bills for the maintenance and tuition of pupils supported by their friends must be paid semiannually in advance.

VI. The charge for pay pupils is \$250 each per annum. This sum covers all expenses in the primary department except clothing, and all in the college except clothing and books.

VII. The Government of the United States defrays the expenses of those who reside in the District of Columbia, or whose parents are in the Army or Navy, provided they are unable to pay for their education. To students from the States and Territories, who have not the means of defraying all the expenses of the college course, the board of directors renders such assistance as circumstances seem to require, as far as the means at its disposal for this object will allow.

VIII. It is expected that the friends of the pupils will provide them with clothing, and it is important that upon entering or returning to the institution they should be supplied with a sufficient amount for an entire year. All clothing should be plainly marked with the owner's name.

IX. All letters concerning pupils or applications for admission should be addressed to the president.

X. The institution is open to visitors during term time on Thursdays only, between the hours of 10 a. m. and 3 p. m. Visitors are admitted to chapel services on Sunday afternoons at a quarter past 3 o'clock.

XI. Congress has made provision for the education, at public expense, of the indigent blind of teachable age belonging to the District of Columbia.

Persons desiring to avail themselves of this provision are required by law to make application to the president of this institution.



THE FREEDMEN'S HOSPITAL- ENTRANCE.

REPORT OF THE FREEDMEN'S HOSPITAL.

FREEDMEN'S HOSPITAL,
Washington, D. C., September 1, 1898.

SIR: I have the honor to herewith submit the report of Freedmen's Hospital for the year ending June 30, 1898:

In referring to the condition, management, and needs of the hospital, and in making such recommendations as seem to me important, you are respectfully requested to carefully consider and give due weight to the recent report of the board of visitors, dated June 24, 1898, whose very exhaustive treatment of every subject touching the welfare of this institution leaves little to be said in the restricted space which must be devoted to my report. As shown in that report, many irregularities therein referred to had already been discovered, and such reformation as was possible had been inaugurated directly after my advent as surgeon in chief. To give permanency to the reforms such a board, representing the Secretary of the Interior, was necessary. It is a subject of congratulation that so efficient a board was chosen. I desire to acquiesce in their said report, and to reiterate all their recommendations.

When I assumed charge of this hospital, on April 1, 1898, I found more than "a mere almshouse." Here was an institution classified into several departments of practical hospital work, with a modern ambulance service, a training school for nurses consisting of an efficient corps of intelligent and skillful young women, and a system of internship composed of graduates from various medical colleges. Smallpox was discovered in one of the wards on the day of my advent. The case having been here one week many were exposed to the contagion, resulting in the development of other cases, which required several weeks of quarantine, thus, for a period of six weeks, practically preventing the routine work of the hospital. Our escape from a dreadful contagion and a large mortality was due more to kind Providence than to our vaunted antiseptics, for I can conceive of no better media for the spread of infection and contagion than the unsanitary buildings we use as wards. In this connection it will be noticed from the tabulated statistics that the number of patients admitted during the past fiscal year was 2,355, as compared with 2,815 for the previous year, ending June 30, 1897. This, in a measure, is accounted for in the fact that the hospital was closed to admissions during a period of about six weeks, while under quarantine.

In addition to what has been said by the board of visitors touching the dual management of this hospital by the Secretary of the Interior and the Commissioners of the District, it is well to say that my expe-

rience as surgeon in chief, covering a period of three months, has clearly demonstrated that the present arrangement is, to say the least, very unfortunate. The situation is exasperating in the extreme, since the surgeon in chief often finds that in his efforts to carry out the rules approved by the Secretary of the Interior for the government of the hospital he runs counter to the specific instructions emanating from the Commissioners of the District. He is, therefore, frequently unable to determine what course to pursue in matters which offer opportunity for conflict of authority. The situation is rendered all the more embarrassing when some of the officers serving under the Commissioners of the District take advantage of every technical point afforded by the act of March 3, 1893 (27 Stat. L., ch. 551), which seems to contravene the authority of the Secretary of the Interior. With a view to changing the existing bisected jurisdiction, which has been aptly spoken of as "unwise and inexpedient," I would respectfully recommend that you request Congress to place the hospital management and finances under the absolute control of the Department of the Interior. The many changes inaugurated in the conduct of affairs at the institution, the formulation of rules and regulations to govern it, and the higher standard of efficiency established here are material evidences of the necessity for the concentration of jurisdiction under one dominating head, who will personally direct and supervise its proper administration.

THE NEEDS.

1. A room for pathological work, which in modern hospitals is a necessary adjunct to successful scientific investigation and diagnosis both in surgery and medicine.

2. An examining room for patients applying for admission. At present there are no proper facilities for performing these duties, it being necessary to consult applicants in the hallway, exposed to public gaze.

3. An office room for the surgeon in chief, who is now compelled to transact official business in the public reception room or his private apartments.

4. A children's ward for the purpose of treating diseases peculiar to that portion of humanity. There are many applicants of this class, and it is not desirable from any point of view to have children in a ward with adults. This, however, has been unavoidable in more than one instance, and I would respectfully request that you take the proper steps thus to afford relief to that portion of suffering humanity who often can not find succor elsewhere.

5. New and modern hospital buildings. The primary object for the establishment of the Freedmen's Hospital was to furnish relief and care to the unfortunate and suffering members of the colored race, but its ultimate end has been the accomplishment of more than this noble purpose, as exemplified in the training of young colored women as professional nurses and in affording an opportunity to the young physicians of that race to acquire proficiency in the science of medicine and surgery. In spite of the difficulties incident to the use of such dilapidated structures as wards a high degree of progress and advancement in hospital work has been attained in this institution—sufficient, indeed, to demonstrate the possibilities of its highest and best usefulness should a generous Government ever see fit to construct modern brick buildings. That we are in need of an entirely new hospital plant is indisputable and self-evident. This long-felt want has been brought

to the attention of the Secretary of the Interior in several successive annual reports submitted by the former surgeon in chief. It was forcibly presented in detail in the report recently submitted by the board of visitors, and was mentioned in the report to Congress by the joint select committee to investigate the charities of the District. I desire to emphasize all that has been said on this important subject and to recommend the urgent and pressing necessity of a new hospital.

I wish further to direct your attention to a tract of land donated by Howard University to the Government of the United States and accepted by an act of Congress dated June 16, 1882. This miniature forest faces Freedmen's Hospital. In its present condition it is a grave menace to the health and well-being of the inmates there. It also presents an unsightly and repugnant appearance. The reservation is overgrown with noxious ferns and tall weeds, matted with filth and rubbish after each rainfall. This pollution floods the hospital grounds to the depth of several inches. The reservation during the day is made a camping ground by the vicious and lazy, while at night it affords a safe retreat for tramps and criminals. The dry, parched grass, together with the shrubby brush, interlaced with zigzag pathways strewn with filth and rubbish, presents a picture which beggars description, and shows this place to be the most neglected spot in this the nation's capital. I desire to recommend that you bring to the attention of the Congress of the United States the said condition of this reservation in order that some steps may be taken to make such improvements as are necessary to prevent disease and add to its appearance. With proper drainage and irrigation the sanitary condition of this immediate locality could be materially improved, and systematic parking, grass plats, and flower beds could transform this unkempt waste into a beautiful and healthful square, thus adding another bright and cheerful spot to the many which adorn Washington.

PAY PATIENTS.

It is desirable that some arrangement should be made by which a ward for pay patients might be established in connection with the hospital. The necessity of this has been largely commented upon in former reports by those having charge of this work, and the board of visitors, after quoting from some of them, indorsed this view and pointed out the propriety of your recommending to Congress that legal sanction be given to the proposed plan. It is rendered more apparent every day that such steps should be quickly taken, and I desire to urge this pressing necessity.

TRAINING SCHOOL FOR NURSES.

The investigation of the board of visitors disclosed the fact that there is no authority in law for the maintenance of this branch of hospital work. Their recognition of the fact, however, that it is a necessary adjunct to the successful conduct of a thoroughly modern hospital caused them to recommend that Congress be asked to give the training school for nurses a legal status. It is not necessary to do more than emphasize their recommendation respecting this matter, for it is apparent to everyone who makes the least pretensions to a knowledge of the proper management of hospitals that such a branch works advantages both to the profession and the public at large.

HOWARD UNIVERSITY MEDICAL SCHOOL.

This hospital, being so closely connected with the Howard University Medical School, secures the colored medical students of this country the greatest advantages of any similar institution. Large numbers of medical students are attracted to said school because of the superior opportunities afforded by the hospital for clinical advantages. While the hospital and school are separate and distinct institutions, they are so closely related in the fundamental object of their establishment as to render them mutually helpful to each other in advancing the material interests of the race for which their existence is rendered necessary. There is no reason why the authorities of the medical school and hospital should not continue to be thus helpful in the interest of science, and, so far as is consistent with approved methods and the prescribed regulations adopted by the Interior Department, every facility will be afforded to the medical school in the prosecution of their commendable endeavors.

I would be derelict in the highest duty to myself and to the race which I represent should I close this report without offering some word of gratitude to you for the deep personal interest you have taken in the general management and highest development of this hospital, and yet the language is so impoverished as to furnish no adequate means of expressing such sentiments as the situation demands. Your long and large experience in matters of business, coupled with the fact of your supervisory connection with some of the largest eleemosynary institutions in this country, renders it especially fortunate for the patrons of Freedmen's Hospital that you, as its authorized head, should, at a time when so many reforms were needed, personally direct the new plans for its management and the codification of rules for its government. You have added a new and memorable epoch to the history of this institution, and the near future will, no doubt, show material evidences of your high purpose to serve that class of humanity who most need sympathy and help.

I herewith append the tabulated statistics of the hospital for the year ending June 30, 1898.

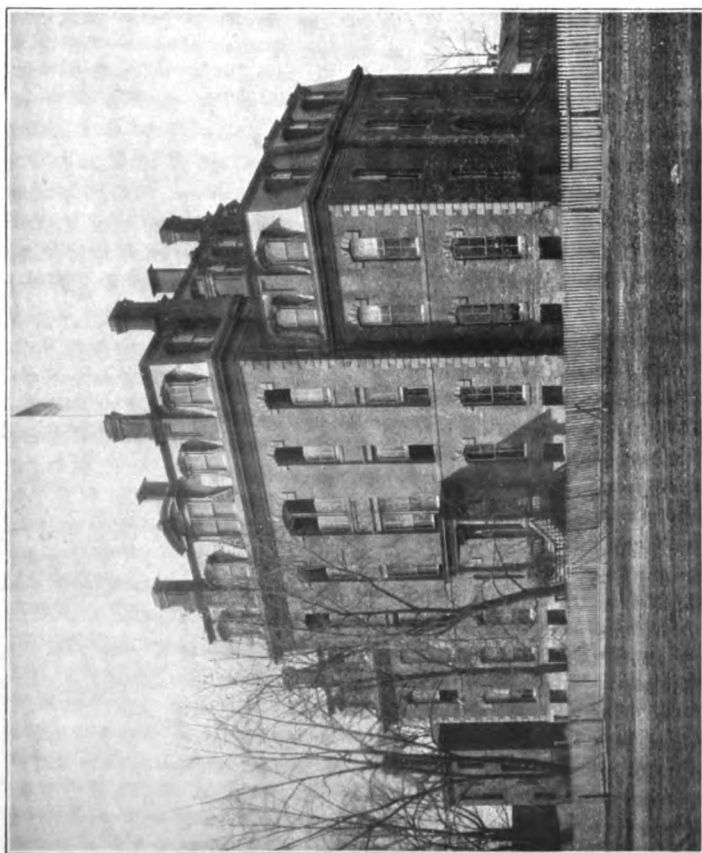
Respectfully submitted.

A. M. CURTIS,
Surgeon in Chief.

The SECRETARY OF THE INTERIOR.

Tabulated summary of cases treated during the fiscal year 1896-97.

	White.		Colored.		Total.
	M.	F.	M.	F.	
Patients remaining June 30, 1897	15	7	61	67	150
Patients admitted	326	41	1,067	715	2,149
Births in hospital, including stillbirths	8	2	113	68	203
Total in hospital	344	50	1,141	870	2,505
Patients discharged	329	48	967	511	2,135
Deaths in hospital	7		62	65	104
Stillborn				8	8
Total	336	48	1,069	584	2,097
Patients remaining June 30, 1898	8	2	72	66	148



THE FREEDMEN'S HOSPITAL—HOWARD UNIVERSITY MEDICAL SCHOOL AND ADMINISTRATIVE BUILDING

Table showing diagnosis, number treated, and condition when discharged from hospital.

Diagnosis.	White.		Colored.		Cured.	Im- proved.	Unim- proved.	Not treated.	Died.	Total.
	M.	F.	M.	F.						
Abscess:										
Mammary		1		7	5	3				8
Umbilical			2		1	1				2
Ischio-rectal	2		2	3	4	3				7
Pudendal				3	2	1				3
Hepatic			1						1	1
Alcoholism	14	2	15	3	11	15	5	3		34
Abortion				16	14	2				16
Anemia	1		1	2	1	2	1			4
Antiversion of uterus				1		1				1
Asthma, bronchial	2		8	2	2	6		1	3	12
Arthritis:										
Acute			3			3				3
Tubercular			2			1	1			2
Syphilitic				1		1				1
Apoplexy			1	4		1	1		3	5
Appendicitis			1						1	1
Adenitis:										
Inguinal	1	1	11	3	5	10	1			16
Inguinal suppurating			2	1		3				3
Specific inguinal			5	1	3	2	1			6
Cervical	2		12	3	9	7	1			17
Aphasia, staxic			2			2				2
Aneurism, popliteal			1						1	1
Angina pectoris	3		1	1		2	2		1	5
Atrophy of optic nerve			1	3			4			4
Amenorrhoea				3	1	2				3
Bite:										
Dog, of leg	3		6		2	7				9
Of arm			2	1		3				3
Of scalp				1		1				1
Insect				3		3				3
Burn:										
Hand	2		4	3	5	4				9
Face			2	2	3	1				4
Leg			2	1	2	1				3
Bronchitis:										
Acute	2	1	6	7	9	7				16
Chronic	3		2			5				5
Capillary				1					1	1
Bubo	2		4	2	4	3		1		3
Blood cyst				1		1				1
Contusion:										
Ankle			4		1	3				4
Scalp	5	1	6	3	8	7				15
Side			3			3				3
Leg	3		5	1	4	5				9
Foot	2		2		2	2				4
Back	1		2	1	1	2	1			4
Hand			3			3				3
Abdomen			2		1	1				2
Eye	1	1	2	2	3	3				6
Shoulder	2		9	3	5	8	1			14
Constipation	3		5	5	9	4				12
Cephalalgia	2		5	4	7	4				11
Condyloma				2		2				2
Cirrhosis of liver			7	2		3			6	9
Cellulitis:										
Hand		1	5	5	3	3				11
Index finger		1	2	2	2	3				5
Leg	1		6	4	5	6				11
Foot	5	1	10	3	15	4				19
Congenital deformity				1		1				1
Convulsions, epileptic	1	1	2	2	2	3		1		6
Cystitis			3	6	5	4				9
Carcinoma:										
Of uterus				6		3	1		2	6
Of testicle			1		1					1
Of bladder			1				1			1
Of cervix				4		2	1		1	4
Of perineum				1			1			1
Chlorosis				2	1	1				2
Cervicitis		1		13	12	2				14
Chaneroid	2	1	10	3	9	6	1			16
Conjunctivitis	2		2	4	6	2				3
Cancer of stomach			1						1	1
Cyst:										
Uterus				1	1					1
Sublingual			1	2	2	1				3

Table showing diagnosis, number treated, etc.—Continued.

Diagnosis.	White.		Colored.		Cured.	Im- proved.	Unim- proved.	Not treated.	Died.	Total.
	M.	F.	M.	F.						
Colic, intestinal.....			2		2					2
Clostrix, palma facia.....			1		1					1
Concussion of brain.....	1					1				1
Carbuncle.....	2				1	1				2
Catarrh, nasal.....	2					2				2
Congestion, hepatic.....	1		1			1				1
Debility:										
Senile.....			4	1		3	1		1	5
General.....	5		3	1		6	3			9
Diarrhea:										
Acute.....	5		8	2	10	5				15
Chronic.....	2		5	1	4	3			1	8
Dysentery:										
Acute.....			1	2	3					3
Chronic.....				1	1				1	1
Dyspepsia, nervous.....	2		4	2	3	3	2			8
Dysmenorrhea.....				5	3	2				5
Degeneration of cervix.....				1	1					1
Dysuria.....				1		1				1
Endocarditis.....			3			4				4
Endometritis.....			20		10	10				20
Gonorrheal.....			3		1	2				3
Erosion of cervix.....				2	1	1				2
Enteritis.....	1		2		1	2				4
Enterocolitis.....			3	1	4					3
Endo-cervicitis.....				2	1	1				2
Epididymitis.....			4		1	3				4
Epithelioma of penis.....	2				1	1				2
Exhaustion, heat.....			4		3				1	4
Emphysema.....				1		1				1
Erysipelas.....			5	3	4	3			1	8
Epilepsy.....	2		3	2		4	2	1		7
Exostosis of dorsal vertebra.....			1				1			1
Eczema.....			6	1	5	2				7
Epistaxis.....			1		1					1
Fever:										
Remitting malaria.....	13	2	27	2	40	10	3		1	54
Intermittent malaria.....	30	1	55	25	80	20	10		1	111
Typhoid.....	2		15	18	25	2				25
Thermic.....			1						1	1
Ephemeral.....	2			2	3	1				4
Puerperal.....				4	2				2	4
Fistula:										
In ano.....			4	1	3	2				5
Fecal.....				1					1	1
Urethro-vaginal.....				1	1					1
Fracture:										
Frontal bone.....			1		1					1
Humerus, upper third.....			1		1					1
Humerus, middle third.....			2		2					2
Clavicle.....			2	1	3	1				3
Inferior maxillary.....			1		1					1
Radius, lower third.....			1	2	3					3
Ulna.....	1		1		1	1				2
External condyle of hu- merus.....			1			1				1
Malar, compound.....	1				1					1
Vertex and intradural hemorrhage.....									1	1
Pott's.....			5		5					5
Colles'.....	2				1	1				2
Radius, upper third.....			1		1					1
Femur, upper third.....	1		1		2					2
Ribs, 10 and 11.....	2		2		3	1				4
Acromion process.....			1			1				1
Furuncle.....	1		1		1					1
Fibroid of uterus.....				5	2		1	2		5
Foreign body in throat.....	1		2	1	4					4
Fissure in rectum.....	1		5	2	5	3				8
Gastritis:										
Acute.....	4		4	4	5	7				12
Chronic.....			3			3				3
Gastroenteritis.....				1	1					1
Gonorrhea.....	2	1	21	6	10	10	3	1		30
With orchitis.....			3		2	1				3
Gastralgia.....			1	2	2	1				3
Graves's disease.....				3	1	1			1	3
Glossitis.....			1		1					1
Gleet.....			1			1				1

Table showing diagnosis, number treated, etc.—Continued.

Diagnosis.	White.		Colored.		Cured.	Im- proved.	Unim- proved.	Not treated.	Died.	Total.
	M.	F.	M.	F.						
Glaucoma				1	1					1
Gangrene of foot			2		1				1	2
Heart:										
Mitral regurgitation	1		8	3		4			8	12
Mitral regurgitation with hypertrophy			8	5		2	1		10	13
Fatty degeneration			4	4			4		4	8
Aortic stenosis	3	1	6			7	3			10
Mitral stenosis			1	1		2				2
Hypertrophy	1			1			2			2
Hemorrhoids:										
External	4		6		7	2	1			10
Internal	1		6	1	4	2		2		8
Hernia:										
Inguinal	1	1	7		5	1	2		1	9
Inguinal, strangulated	1				1				1	2
Umbilical				2					2	2
Hysteria			2	5	2	4		1		7
Hypochondriasis			1	1	1	1				2
Hemorrhage, pulmonary			2		1	1				2
Homaturia				2		1	1			2
Hydrocele	1		3	4						4
Hemiplegia	3		3	5	2	6	2		1	11
Hepatitis			1	2	3					3
Hemorrhage, cerebral			4	1					5	5
Hypertrophy:										
Of prostate	2					2				2
Of cervix				3		2	1			3
Indigestion	4	3	4	12	11	11		1		23
Intestinal			4	4	4	2			1	7
Intestinal obstruction			1						1	1
Incontinence of urine			1		1					1
Iritis			2	1	2	1				3
Syphilitic			1	2		3				3
Insanity	1			1		1	1			2
Influenza				1						1
Icterus	1			1	1					2
Keratitis			1	1	2					1
Keloid			3	1	3	1				4
Lipoma of back			1		1					1
Lupus									1	1
Lumbago	4	1	4	4	7	6				13
Laryngitis:										
Acute			6	4	9	1				10
Tubercular			1			1				1
Laryngismus stridulus				1		1				1
La grippe			6	4	9	1				10
Mania			1	1			2			2
Miscarriage				10	9	1				10
Meningitis:										
Spinal			1		1					1
Cerebro-spinal			1	1					2	2
Melancholia			1				1			1
Metrorrhagia				5	3	2				5
Menorrhagia		1		6	5	2				7
Metritis				7	5	2				7
Marasmus			3	2					5	5
Myalgia	1		7		5	3				8
Menopause				1				1		1
Mastitis				1	1					1
Moluscum fibroma	1				1					1
Nephritis:										
Acute		1	2	5	4	4				8
Interstitial			5	2	2	2			3	7
Parenchymatous			7			4			3	7
Necrosis of inferior maxil- lary				2	1	1				2
Neuralgia:										
Facial		1	1		2					2
Intercostal				1	1					1
Neurasthenia			1	4	1	4				5
Neuritis			1	1		2				2
Narcosis, opium	2			1	1	1	1			3
Not treated	2			2				4		4
Osteo-myelitis of tibia			2	1	2	1				3
Orethritis			12		8	4				12
Ovaritis				15	8	7				15
Otitis media				1	1	2				2
Osteoma of scapula			1		1					1

Table showing diagnosis, number treated, etc.—Continued.

Diagnosis.	White.		Colored.		Cured.	Im- proved.	Unim- proved.	Not treated.	Died.	Total.
	M.	F.	M.	F.						
Ophthalmia, gonorrheal			1		1					1
Pleurisy:										
Acute	3		6	5	8	6				14
Chronic	2		2		1	2				4
Phlegmon of leg	2			1	1	2				3
Pneumonia:										
Lobar			22	2	11	2			12	25
Lobular	1		5	2	8				1	9
Premature birth				2					2	2
Pericarditis			5	1	5	2				6
Peritonitis			6	1	1				4	7
Tubercular			1			2				1
Poison:										
Lead	1				1					1
Ammonia				1	1					1
Atropine			1		1					1
Petroleum			1	1	1					2
Paralysis	2		1	2		2	1	1	1	6
Pharyngitis, acute			4	2	5	1				6
Pyosalpinx				4	1	2		1		4
Phimosis	1		10		8			1		11
Prolapse of rectum				1		1				1
Pyemia			1	1		1			1	2
Pleurodynia			1		1					1
Polypus:										
Nasal	1		2		3					3
Uterine				1	1					1
Pyralism				1	1					1
Puerperal mania				1			1			1
Rubeola	2			1	3					3
Retention of urine	3		2		2	3				5
Retinitis, hemorrhagic				2		2				2
Rheumatism:										
Acute articular	4		3	4	3	8				11
Chronic articular	8	1			4	8	1			13
Acute muscular	4		11	9	10	14				24
Chronic muscular	12		16	5	2	25	4	1		33
Acute inflammatory	1		11	1	6	7				13
Rape				1		1				1
Suppuration of mastoid cells			2			2				2
Syphilis:										
Primary			2	4		7				7
Secondary	3	7	24	20	16	33	2	3		54
Tertiary	3		3	8	1	11	1		1	14
Congenital			2			2				2
Subluxation:										
Ankle	1		2	1	2	2				5
Shoulder			2	2	2	1				4
Wrist	3		5	4	4	8				13
Stricture:										
Urethra	5		9		6	8				14
Rectum				1					1	1
Sarcoma of testicle			1						1	1
Synovitis:										
Acute			3	1	2	2				4
Tubercular			1			1				1
Sciatica			1	1		2				2
Salpingitis				2		2				2
Sarabismus, external			1		1					1
Sarcoma:										
Of uterus				1	1					1
Of thigh			1	1		1	1			2
Of base of brain				1	1					1
Sclerosis of liver			1	1		1			1	2
Sclerosis of ovaries				1	1					1
Scurbutus	1					1				1
Septicemia			4	1					5	5
Supernumerary fingers			2		2					2
Tonsillitis:										
Acute	1		7	5	7	5			1	12
Follicular	2		2	18	15	7				23
Tuberculosis:										
Pulmonary	12		55	25		24	25	1	32	92
Pulmonary, incipient			5	2		5	1	1		7
Acute miliary			3	1					4	4
Intestinal				1		1				1
Of spine			1						1	1
Of kneejoint			1	4		4	1			5
Of hipjoint			2			1	1			2
Osteo-myelitis of femur	1		1	1		3				3

Table showing diagnosis, number treated, etc.—Continued.

Diagnosis.	White.		Colored.		Cured.	Im- proved.	Untim- proved.	Not treated.	Died.	Total.
	M.	F.	M.	F.						
Tumor, sebaceous.....	2		4	1	6	1				7
Tumor, fibroid, of uterus.....				4	2	2				4
Ulcer:										
Chronic, of leg.....	5	1	17	16	10	23	6			39
Syphilitic, of leg.....	1		3			3		1		4
Syphilitic, of lip.....				1		1				1
Corneal.....			2	1		3				3
Of foot.....			1		1					1
Uremia.....			2	1					3	3
Urethritis, simple.....			1	1	2					2
Urticaria.....				1	1					1
Uterus:										
Subinvolution.....				3	2	1				3
Retroflexion.....				3	1	2				3
Retroversion.....		2		9	4	5	2			11
Vertigo.....				1	2	1	2			3
Varicose veins of leg.....	3				1	1		1		3
Vulvitis.....				3	3					3
Varicocoele.....				1	1					1
Varicella.....			7	2		2	7			9
Wound:										
Incised, of scalp.....	2		11	3	3	13				16
Incised, of face.....	3		15		8	10				18
Incised, of thigh.....	1			3	3	1				4
Incised, of leg.....	1		4		1	4				5
Incised, of forearm.....			3	1	1	3				4
Incised, of foot.....	1				1	1				2
Incised, of hand.....	2		9	3	4	10				14
Incised, of neck.....	1		1		2					2
Lacerated, of scalp.....	10		50	15	21	54				75
Lacerated, of shoulder.....			2	1	1	2				3
Lacerated, of hand.....	2	1	10	6	5	14				19
Lacerated, of lip.....	1	1	4	2	2	6				8
Lacerated, of face.....	13		21	2	11	25				36
Lacerated, of finger.....	3			2	1	4				5
Lacerated, of forearm.....	7	1	7	2	7	10				17
Lacerated, of scrotum.....			2		2					2
Lacerated, of leg.....	1		3	3	2	5				7
Contused, of scalp.....			11	1	3	9				12
Contused, of thigh.....	2		6	1	4	5				9
Contused, of eye.....	1		1	1	2	1				3
Punctured, of shoulder.....			4	2	2	4				6
Punctured, of foot.....			3	1	1	3				4
Punctured, of hand.....		1	2	3	2	4				6
Punctured, of arm.....	2		1		1	2				3
Punctured, of leg.....	2				1	1				2
Punctured, of vagina.....				3	1	2				3
Punctured, of finger.....	2		2	1	3	2				5
Stab, of abdomen.....			2	2	2	2				4
Stab, of chest.....	1		3	1	3	2				5
Bullet, of throat.....			1							1
Bullet, of thigh.....			1	1	1	1				2
Bullet, of forearm.....			2		2					2
Bullet, of hand.....			1		1					1
Bullet, of face.....			1			1				1
Bullet, of chest.....	1				1					1
Total.....	326	41	1,067	715	902	928	125	30	164	2,149

a Removed to the smallpox hospital.

Table showing diagnosis, number of operations, and results during the year.

Operations.	Diagnosis.	White.		Colored.		Total.	Cured.	Improved.	Unimproved.	Died.
		M.	F.	M.	F.					
Amputations:										
Mammary gland.....	Adenoma.....				2	2	2			
Do.....	Carcinoma.....				1	1	1			
Cervix uteri.....	Hypertrophy.....				2	2	2	1		
Penis.....	Epididymitis.....	1			1	1	1			
Leg, middle third.....	Gangrene and ulceration of popliteal vessels.....			1		1				1
Old stump.....	Necrosis of tibia.....			1		1	1			
Arthrotonomy.....	Tuberculosis of knee joint.....			1		1		1		
Celiotomy.....	Tubercular peritonitis.....			1		1		1		
Do.....	Secondary hernia following suprapubic hysterectomy.....			1	1	2	1			
Do.....	Strangulated ventral hernia with a gangrenous gut.....				1	1				1
Castration:										
Double.....	Sarcoma of testicles.....	1				1	1			
Single.....	.....do.....	1				1	1			
Do.....	Gangrene of testicle.....	1				1				1
Cæsarean section	Pregnancy complicated with a large fibroid tumor.....				1	1	1			
Canterization	Fistula in ano.....			1		1	1			
Clamp and cautery	Hemorrhoids.....				2	2	2			
Circumcision	Phimosis.....			5		5	5			
Curetment of uterus	Retain placenta.....		1		3	4	4			
Excision	Painful clitoris.....			1	1	2	2			
Hamus of pubis.....	Necrosis.....			1		1			1	
Tonails.....	Hypertrophy.....			1	1	2	2			
Excision	Keloid of neck.....			2		2				
Of hip joint.....	Tuberculosis of hip joint.....			1		1			1	
Of knee joint.....	Tuberculosis of knee joint.....			1	1	2		1		
Excision	Necrosis of inferior maxillary.....			1		1		1		
Do.....	Hemorrhoids, external.....			3		3	3			
Excision and sutured	Urethral fistula.....			1	1	2	2			
Extirpation	Sebaceous tumor of scalp.....			1	1	2	2			
Of cervical glands.....	Tubercular adenitis.....			1		1	1			
Extirpation	Lipoma of back.....	1				1				
Iodoformization	Tuberculosis of knee joint.....			1	1	2		1	1	
Do.....	Tuberculosis of hip joint.....			1		1			1	
Incision	Hydrocele.....			2		2	2			
And drainage.....	Empyema.....			2	1	3	3	1		
Incision	Pudendal abscess.....			2	2	4	4			
Do.....	Ischio-rectal abscess.....			4	2	6	6			
Do.....	Mammary abscess.....				2	2	2			
Do.....	Cellulitis of hand.....	1				1	1			
Do.....	Cellulitis of foot.....	1	1			2	2			
Do.....	Perineal abscess.....			1		1	1			
Do.....	Alveolar abscess.....	1				1	1			
Do.....	Cellulitis of arm.....			1		1	1			
And drainage per vagina.....	Pyosalpinx.....				1	1	1			
Crucial	Furuncle, large.....	1		2		3	3			
And curetment.....	Suppurating mastoid cells.....			1		1	1			
Ligation of femoral artery	Popliteal aneurism.....			2		2	2			
Lithotomy, median	Vesical calculus.....			1		1	1			
Ovariectomy	Ovarian cysts.....				1	1	1			
Paracentesis thoracis	Hydrothorax.....			2		2	2			
Perineal section	Ruptured urethra.....			1		1	1			
Radical cure	Strangulated inguinal hernia.....			1		1	1			
Do.....	Inguinal hernia.....			3		3	3			1
Do.....	Ventral hernia.....			1		1	1			
Reduction	Subglenoid luxation of humerus.....			3		3	3			
Of fractures.....	Fracture of tibia, upper third, and fibula, lower third.....			1		1	1			
Do.....	Fracture of femur, middle third.....				1	1	1			
Do.....	Fracture of tibia, middle third.....			2		2	2			
Do.....	Fracture of tibia and fibula, middle third.....			1		1	1			
Do.....	Pott's fracture.....			1		1	1			
Do.....	Fracture of clavical.....			4		4	4			
Do.....	Fracture of eighth and tenth ribs.....			1		1	1			
Do.....	Fracture of radius, middle third.....			3	1	4	4			
Do.....	Colles' fracture.....	2				2	2			
Do.....	Fracture of inferior maxillary.....			1		1	1			
Do.....	Fracture of humerus, middle third.....	1		1		2	2			
Do.....	Fracture of anatomical neck of humerus.....			2		2	2			

Table showing diagnosis, number of operations, etc.—Continued.

Operations.	Diagnosis.	White.		Colored.		Total.	Cured.	Improved.	Unimproved.	Died.
		M.	F.	M.	F.					
Reduction—Continued.										
Of fractures	Fracture of external malleolus.	1				1	1			
Do	Fracture of external condyle of humerus.			1		1	1			
Do	Fracture of ulna, lower third.			1		1	1			
Do	Fracture of malar bone, compound.	1				1	1			
Suturing	Incised wound of scalp.	4		13	5	22	22			
Do	Incised wound of foot.	1		2		3	3			
Do	Incised wound of forearm.	2		3	1	6	6			
Do	Incised wound of thigh.				1	1	1			
Do	Incised wound of face.	1		6		7	7			
Do	Incised wound of hand.	2		2		4	4			
Do	Lacerated wound of scalp.	9	2	24	10	55	55			
Do	Lacerated wound of leg.	1		2		3	3			
Do	Lacerated wound of scrotum.				2	2	2			
Suprapubic cystotomy.	Stricture of urethra.	1		1		2	1	1		
Supravaginal amputation of ovaries and tubes.	Pyosalpinx.				2	2	2			
Do	Ovarian cyst.				1	1	1			
Do	Multiple fibroma of uterus and cystic degeneration of ovaries.				1	1	1			
Supravaginal amputation of uterus.	Fibroid of uterus.				3	3	3			1
Trephining.				1		1	1			
Tracheotomy.	Edema of glottis.			1		1		1		
Urethrotomy:										
Internal.	Stricture of urethra.	1		1		2	1	1		
External.	do.			1		1	1			
Vaginal hysterectomy.	Cystic degeneration of uterus.				1			1		
Whitehead's operation.	Hæmorrhoids.			1		1	1			
Total		38	4	140	54	234	214	11	4	5

Table showing work done in eye and ear department.

Disease.	Eye.					Ear.				
	White.		Colored.		Total.	White.		Colored.		Total.
	M.	F.	M.	F.		M.	F.	M.	F.	
Atrophy of optic nerve.	1		5	2	8					
Astigmatism:										
Hypermetropic.			3		3					
Myopic.			4	1	5					
Blepharitis.		3	4	2	9					
Choroiditis.	1		2		3					
Ceruminous deposits.						2	1	6	5	14
Conjunctivitis:										
Purulent.			1	2	3					
Phlyctenular.		3	4	3	9					
Catarrhal.	2	1	10	19	32					
Cataract:										
Senile.			2	5	7					
Inflammatory.			2	1	3					
Catarrh:										
Acute aural.						1		4	5	10
Chronic aural.						2	1	3	3	9
Cyst, meibomian.	2		4	3	9					
Ectropion.	1		2	4	7					
Epiphora.	1		4	2	7					
Glaucoma, double.			1		1					
Hordolum.	2	1	4	4	11					
Hypermetropia.	1		2	4	7					
Iritis.	2	1	10	5	18					
Phlyctenular.			2	1	3					
Kerato.			1	1	2					
Myopia.			4	2	6					
Opacity, corneal.	1	1	4	7	13					
Presbyopia.			1	1	2					
Ptoxis.	1		4		5					
Pterygium.			5		5					

Table showing work done in eye and ear department—Continued.

Disease.	Eye.					Ear.				
	White.		Colored.		Total	White.		Colored.		Total
	M.	F.	M.	F.		M.	F.	M.	F.	
Otorrhea.....						2		4	2	8
Otitis media.....								1		1
Retinitis.....	1		2	3	6					
Staphyloma.....			1		1					
Strabismus.....			3	4	7					
Ulcer, corneal.....	1		3	4	8					
Total.....	17	10	94	79	200	7	2	18	15	42

NOTE.—There were 855 visits to the eye and ear department, 683 for treatment of the eye and 172 for treatment of the ear.

Table showing work done in obstetrical department.

Months.	Births.				Still births.	Total.
	White.		Colored.			
	M.	F.	M.	F.		
July.....	1	.....	12	.....	.....	13
August.....	2	.....	11	9	1	23
September.....	.....	.....	13	6	.....	19
October.....	.....	.....	8	7	1	16
November.....	.....	1	6	10	.....	17
December.....	.....	.....	10	11	1	22
January.....	.....	.....	8	10	1	19
February.....	.....	.....	10	3	1	14
March.....	.....	.....	9	9	.....	18
April.....	.....	1	5	3	.....	10
May.....	.....	.....	10	5	1	16
June.....	.....	.....	11	7	1	19
Total.....	3	2	113	80	8	203

Table showing nature of disease and number treated in out-patient department.

Disease.	Medical.				Surgical.				Gynecolog- ical.	Total.
	White.		Colored.		White.		Colored.			
	M.	F.	M.	F.	M.	F.	M.	F.		
Adenitis:										
Cervical.....						1	6	4		11
Specific cervical.....							5	1		6
Inguinal.....							16	5		21
Specific inguinal.....							1			1
Tubercular cervical.....							5	4		9
Submaxillary.....							2			2
Alcoholism.....	1		7							8
Asthma:										
Cardiac.....			19	5						24
Bronchial.....			1	10						11
Amenorrhoea.....									12	12
Abortion, threatening.....									2	2
Antiversion of uterus.....									2	2
Arthritis, tubercular.....							4	2		6
Anemia.....			9		1		15			25
Adenoma of mammary gland.....								1		1
Acne.....			2	1				1		3
Angina pectoris.....			1							1
Arsenic poisoning.....			1							1
Aphasia.....			4							4
Abrasion of penis.....							1			1
Ankylosis of knee joint.....							1			1
Anasarca.....							1			1
Bronchitis:			4							4
Acute.....	6	3	120	105						244
Chronic.....	4	1	75	60						140

Table showing nature of disease and number treated in out-patient department—Continued.

Disease.	Medical.				Surgical.				Gynecolog- ical.	Total.
	White.		Colored.		White.		Colored.			
	M.	F.	M.	F.	M.	F.	M.	F.		
Bubo.....							20	1		21
Burn of leg.....							1	1		2
Contusion:										
Of arm.....							6	1		7
Of shoulder.....							7	1		8
Of back.....							6	2		8
Of leg.....					2	2		1		5
Of scrotum.....					1					1
Of scalp.....							9			9
Cellulitis of hand.....							4	1		5
Carbuncle.....					1		1			2
Congestion, hepatic.....			3	1						4
Chlorosis.....				6						6
Cystitis.....	1		38	6						45
Cancer of mouth.....							1			1
Constipation.....	11	1	81	95						188
Chordee.....							1			1
Catarrh:										
Gastric.....	2		2	1						5
Naso-pharyngeal.....			6	2						8
Post-nasal.....	5		22	21						48
Cephalalgia.....		1	8	13						22
Coryza.....			7	3						10
Chancre.....							6	1		7
Chancroid.....					4		25	2		31
Condyloma.....							8	7		15
Convulsion, infantile.....				1						1
Colitis.....			1							1
Chilblain.....							1	1		2
Cirrhosis of liver.....			2							2
Dyspepsia:										
Acute.....			31	25						56
Chronic.....			10	6						16
Dysmenorrhœa.....									23	23
Dysentery.....	1			1						2
Debility:										
General.....	2		6	3						11
Senile.....			3	3						6
Dysuria.....	1		6							7
Diarrhœa:										
Acute.....	3	1	6	5						15
Chronic.....	2									2
Delirium tremens.....	1		1							2
Eczema:										
Papulosum.....	1	2	15	19						37
Squamosum.....			7	3						10
Erythematosum.....			8	3						11
Epilepsy.....			1	9						10
Epididymitis.....					1		1			2
Endometritis.....									14	14
Emphysema.....			1							1
Erysipelas.....				1						1
Endocarditis.....			2	1						3
Erosion of cervix.....									6	6
Flatulency.....				3						3
Fibroid of uterus.....									1	1
Furuncle.....							2	2		4
Fatty tumor of back.....							2			2
Gastritis:										
Acute.....				5						5
Chronic.....	1			5						6
Gonorrhœa.....					16		94	6		116
Gastralgia.....			4							4
Gleet.....							3			3
Goiter.....								2		2
Heart:										
Aortic stenosis.....			16	3						19
Hypertrophy.....			1	3						4
Mitral regurgitation.....			10	1						11
Mitral stenosis.....			4	1						5
Dilatation.....			3	10						13
Functional irregularity.....			2	2						4
Hysteria.....			3	8						11
Herpes zoster.....			1			1				2
Hæmoptysis.....			1					2		3
Hyperæmia:										
Cerebral.....			2	4						6
Spinal.....			4	2						6

Table showing nature of disease and number treated in out-patient department—Continued.

Disease.	Medical.				Surgical.				Gynecolog- ical.	Total.
	White.		Colored.		White.		Colored.			
	M.	F.	M.	F.	M.	F.	M.	F.		
Hemorrhoids					2		5	3		10
Hydrocele							1			1
Hemorrhage, cerebral			2							2
Hematuria	1		2	1						4
Hernia, inguinal	1			1						2
Hypochondriasis		1		1						2
Hemicrania	1		2	4						7
Hypertrophy of prostate							1			1
Intestinal indigestion	2	2	32	29						65
Incontinence of urine	2		5	10						17
Insomnia			5	5						10
Impotency			2							2
Influenza			12	6						18
Lumbago			21	10						31
Leucorrhœa									12	12
Lumbrocoides			5	2						7
Laryngitis:										
Acute			9	7						16
Tubercular				1						1
La grippe	1		8	3						11
Lipoma of back							1	2		3
Locomotor ataxia			2							2
Lacerated cervix									6	6
Malaria:										
Intermittent	9	1	50	24						84
Remittent	4		14	5						23
Metritis									10	10
Myalgia			11	8						19
Metorrhagia									8	8
Menorrhagia									16	16
Menopause									10	10
Mumps			1	1						2
Meningitis			3							3
Migrain			1							1
Miscarriage									1	1
Neuralgia:										
Facial			10	17						27
Ovarian									4	4
Nephritis:										
Acute			10	8						18
Subacute			2	2						4
Chronic			2	2						4
Neurasthenia		1	7	5						13
Ovaritis									7	7
Orchitis					4		14			18
Odontalgia			3	2						5
Peritonitis			2	1						3
Pleurodynia	1	1	9	18						29
Pleurisy:										
Acute	1	2	14	9						26
Chronic			5							5
Pharyngitis, acute	2		9	2						13
Phlegmon of arm							2			2
Paralysis, facial			1	1						2
Prostatitis			2							2
Poison, carbolic acid			1							1
Polypus, nasal							3			3
Pyrosis				2						2
Pertussis			2							2
Phimosis					1		7			8
Ptyalism				3						3
Paralysis agitans			4	2						6
Pregnancy				12						12
Pneumonia			1							1
Puritis									4	4
Pericarditis			5							5
Parametritis									2	2
Rheumatism:										
Acute	7		37	30						74
Muscular	6		51	31						88
Intercostal			11	1						12
Retroversion of uterus									8	8
Rhinitis, acute			12	4						16
Syphilis:										
Primary					3	3	19	9		34
Secondary					10	9	77	45		143
Tertiary					12	4	6	7		29
Stricture of urethra							7			7

Table showing nature of disease and number treated in out-patient department—Continued.

Disease.	Medical.				Surgical.				Gynecological.	Total.
	White.		Colored.		White.		Colored.			
	M.	F.	M.	F.	M.	F.	M.	F.		
Stomatitis	1		3	4						8
Subluxation of ankle							3	2		5
Stenosis of cervix									1	1
Sciatica			2							2
Sclerosis, spinal			4							4
Sarcoma of uterus									3	3
Synovitis	1	1	4	1						7
Tuberculosis:										
Pulmonary	2	1	64	21						88
Incipient			11	7						18
Tonsillitis:										
Acute	2		24	30						56
Chronic		1	6	5						12
Follicular		2	4	8						14
Torticollis			3	5						8
Tinea capitis			6	2						8
Ulcer:										
Varicose							1	2		3
Chronic of leg							4	1		5
Specific of leg							3			3
Urticaria	2		4	2						8
Vertigo			4	1						5
Vaginitis									4	4
Total	88	22	1,097	811	57	21	393	135	162	2,786

Nativity of patients.

Nativity.	White.		Colored.		Total.	Nativity.	White.		Colored.		Total.
	M.	F.	M.	F.			M.	F.	M.	F.	
Alabama			2		2	Massachusetts	11		1	2	14
Austria	1				1	Missouri	3	1	1	2	7
Bohemia	1				1	Mississippi			1	5	6
Canada	2		2		4	Michigan	2		1	2	5
Connecticut	2		1	1	4	Minnesota			1	1	2
Corea	1				1	Montana					1
Colorado			1	1	2	New Jersey	37	7	5	8	57
District of Columbia	80	13	327	238	668	New York	4	1	2	1	8
Delaware			4	1	5	North Carolina	2		44	15	61
Denmark	4				4	Nova Scotia			1		1
England	5		1		6	Ohio	16		5	6	27
Florida			3	1	4	Pennsylvania	25	3	11	12	51
France	1				1	Poland	1				1
Georgia			26	3	29	Rhode Island			3	1	4
Germany	21	1			22	Russia	3				3
Indian Territory			2		2	South Carolina			15	4	19
Indiana	1				1	Switzerland	2				2
Iowa	1		1		2	Scotland	3				3
Illinois	2	1	4		7	Tennessee	1		7	4	12
Italy	4				4	Texas	1		2		3
Ireland	38	1	1	1	41	Virginia	20	7	309	197	532
Kentucky			3	1	4	West Virginia			8	6	14
Louisiana	2		1	1	4						
Maryland	25	6	273	200	508	Total	326	41	1,067	715	2,149

Occupation of patients.

Occupation.	White.		Colored.		Total	Occupation.	White.		Colored.		Total
	M.	F.	M.	F.			M.	F.	M.	F.	
Apprentice.....	4		1		5	Harness maker.....	5				5
Bootblack.....			15		15	Janitor.....			23		23
Bellman.....			10		10	Junk dealer.....			20		20
Bookkeeper.....			4		4	Laborer.....	55		505		560
Bicycle teacher.....			5		5	Laundress.....				72	72
Blacksmith.....			7		7	Lawyer.....	2				2
Butcher.....			5		5	Merchant.....	4				4
Barber.....	10		50		60	Musician.....			8		8
Baker.....	6				6	Messenger.....	1		11		12
Baseball player.....	10				10	Molder.....	2				2
Butler.....			8		8	Mechanic.....	5				5
Bricklayer.....	7				7	Minister.....			4		4
Bartender.....	10				10	Mattress maker.....	1				1
Cashier.....	2	1	2		5	Newsboy.....	3				3
Cigar maker.....	3				3	Nurse.....	3	3	7		10
Caterer.....			10		10	News-dealer.....	4				4
Cabinetmaker.....	1		1		2	Oyster dealer.....	5				5
Cooper.....			4		4	Painter.....	2				2
Carpenter.....	8		5		13	Policeman.....	11				11
Cook.....	2	2	49		53	Peddler.....	3				3
Clerk.....	5				5	Plumber.....	3				3
Contractor.....	2				2	Pupil.....	2	3	20	15	38
Chambermaid.....			4		4	Paper hanger.....	2				2
Coachman.....	2		13		15	Printer.....	2				2
Collector.....	5				5	School teacher.....	6		4	5	9
Confectioner.....	8				8	Salesman.....	8				8
Candy maker.....	12				12	Soldier.....	8				8
Dyer.....		22			22	Silversmith.....	2				2
Domestic.....				480	480	Shoemaker.....	2				2
Driver.....	30				30	Stonemason.....	6				6
Dressmaker.....	2			35	37	Tinner.....	9				9
Editor.....	1				1	Trainer.....	2		42		44
Ex-soldier.....	9				9	Teamster.....	8		130	28	162
Engineer.....	4				4	Unknown.....	2	6	30		38
Fireman.....	2				2	Walter.....	5		7		12
Farmer.....	8		18		26	Watchman.....					
Footman.....			19		19						
Gardener.....			8		8						
Huckster.....	10		34		44						
						Total.....	326	41	1,074	708	2,149

Number admitted each year for past twenty-four years.

Year ending June 30—	Num- ber.	Year ending June 30—	Num- ber.	Year ending June 30—	Num- ber.
1875.....	190	1883.....	1,373	1891.....	2,373
1876.....	319	1884.....	1,509	1892.....	2,331
1877.....	500	1885.....	1,794	1893.....	2,422
1878.....	519	1886.....	1,923	1894.....	2,801
1879.....	642	1887.....	2,017	1895.....	2,476
1880.....	819	1888.....	1,997	1896.....	2,596
1881.....	892	1889.....	2,074	1897.....	2,815
1882.....	1,102	1890.....	2,392	1898.....	2,355

APPENDIX.

Following is the report of the training school for nurses, under the supervision of Miss Sarah C. Ebersole, directress of nurses.

The school has enlarged its usefulness to the extent of placing a nurse in charge of the operating room at night, who prepares surgical supplies and assists in emergency work. There were 70 formal applications for admission to this department during the year; 17 were admitted on probation, 13 were accepted and enrolled, and 3 have been dismissed for various reasons. Seventeen graduated on May 5, 1898. There are 32 nurses enrolled in the school at present. The usual number of lectures have been delivered to the classes. The final examinations were conducted by the following lecturers on their respective subjects, viz:

E. A. Balloch, general surgery.
 N. E. Jenner, M. D., obstetrics and care of infants.
 D. H. Williams, M. D., gynecology and abdominal nursing.
 J. M. Lamb, M. D., physiology.
 F. E. Maxcy, M. D., hygiene and general medical nursing.
 E. O. Belt, M. D., ophthalmology and otology.
 W. A. Warfield, M. D., anatomy and bacteriology.
 Prof. L. J. Sanders, massage.

Graduates of 1898.

Anthony, Grace E	Vermont.
Bennett, Florence R	Maryland.
Bannister, Carrie J	Virginia.
Carter, Edith M	New York.
Cabanias, Martha E	Virginia.
Davis, Annie Miller	Tennessee.
Ennies, Sarah J	West Indies.
Goder, Isabella	New York.
Gaines, Mary R	Maryland.
Hurlong, Mary A	South Carolina.
King, Carrie M	Canada.
Russell, Ruby E	Florida.
Robinson, Amelia A	Pennsylvania.
Sumby, Lillie May	District of Columbia.
Stanton, Priscilla	Pennsylvania.
Valentine, J. Ella	Indiana.
Whitson, Clara E	New York.

List of graduates, their present whereabouts and occupations.

1896.

Name.	Occupation.	Residence.
Ashton, Luci V	Superintendent and matron Provident Hospital.	Baltimore, Md.
Blackburn, N. L.	Private nurse	Philadelphia, Pa.
Burke, Julia	do	Baltimore, Md.
Fleetwood, Sara T	do	Washington, D. C.
Foust, Isabelle L	do	Winston, N. C.
Gibson, Katherine C	do	Washington, D. C.
Green, Anna M	do	Do.
Owens, Laura A	do	Do.
Pierce, Letitia, now Mrs. Blair	do	Nicaragua, Central America.
Ricks, Antoinette M	Private nurse	Cleveland, Ohio.
Robinson, Annie B	Superintendent and matron Good Samaritan Hospital.	Charlotte, N. C.
Shorter, Sarah A	Private nurse	Newport, R. I.
Simms, Annie A	do	Washington, D. C.
Smith, M. Gertrude	do	Do.
Tyler, Elizabeth W	do	Northampton, Mass.

List of graduates, their present whereabouts and occupations—Continued.

1897.

Name.	Occupation.	Residence.
Combs, Annie E.	Sanitarium	Battle Creek, Mich.
Caldwell, Amanda I.	Private nurse	Charlotte, N. C.
Griffin, G. Josephine	do	Washington, D. C.
Green, Lucille	Still in school	Do.
Haithcock, Ada	Private nurse	Toronto, Canada.
King, Annie C.	do	Washington, D. C.
Rollins, Willie M.	do	Do.
Smith, S. May	Still in school	Chester, Pa.
Thompson, Della R., now Mrs. Davis	Private nurse	Washington, D. C.
Thomas, Annie M.	do	Do.
Underhill, Katherine P.	do	Do.
Webb, Evangeline M. L.	Still in school	Do.
Warner, Florence A.	Private nurse	Do.
Young, Lola E. M.	do	Do.

1898.

Anthony, Grace E. ....	.....	Still in school.
Bennett, Florence R. ....	.....	Do.
Bannister, Carrie J. ....	.....	Do.
Carter, Edith M.	Private nurse	New Rochelle, N. Y.
Cabanias, Martha E. ....	.....	Still in school.
Davis, Annie Miller .....	.....	Do.
Ennies, Sarah J.	Private nurse	Washington, D. C.
Geder, Isabella .....	.....	Still in school.
Gaines, Mary R. ....	.....	Do.
Hurlong, Mary A. ....	.....	Do.
King, Carrie M.	Private nurse	Toronto, Canada.
Russell, Ruby E. ....	.....	Still in school.
Robinson, Amelia A. ....	.....	Do.
Stanton, Priscilla	Private nurse	Pittsburg, Pa.
Summy, Lillie May	do	Washington, D. C.
Valentine, J. Ella .....	.....	Still in school.
Whiteon, Clara E.	Private nurse	Rhinecliff, N. Y.

CIRCULAR OF INFORMATION SENT APPLICANTS.

Those wishing to obtain this course of instruction must apply to the surgeon in chief of the Freedmen's Hospital, Washington, D. C., upon whose approval they will be received into the school for one month on probation. The most acceptable age for candidates is from 21 to 35 years. The applicants should send, with answers to the paper of questions, a letter from a clergyman testifying to their good moral character, and from a physician stating that they are in sound health. Applicants are received at any time during the year when there is a vacancy. During the month of trial, and previous to obtaining a position in the school, the applicant will be examined in reading, penmanship, simple arithmetic, and English dictation. Those who prove satisfactory will be accepted as pupil nurses, after signing an agreement to remain two years and to obey the rules of the school and hospital. They will reside in the home, and serve as assistants in the wards of Freedmen's Hospital.

During the month of probation the pupils are boarded and lodged at the expense of the school, but receive no other compensation. In addition to their board and lodging, the nurses will be provided with hospital dresses, caps, the necessary note and text books, \$5 per month, and, on completion of their two years, will receive, on passing a satisfactory final examination, their diplomas. This is not given as pay for services rendered, as the training given and the profession acquired is considered an ample equivalent, but simply to enable young women without pecuniary resources to enter upon their professional career free from debt. They are required, after the month of probation, when on duty, to wear the dress prescribed by the institution, which is of blue seersucker, simply made, white apron and cap, and linen collar and cuffs.

The day nurses are on duty from 7.30 a. m. to 7.30 p. m., with an hour off for dinner and additional time for exercise or rest. They are also often given an afternoon during the week, and have a right to the half of Sunday. A vacation of two weeks is allowed each year. It is not proposed to place nurses on night duty until they have been in the school three months.

In sickness all pupils will be cared for gratuitously.

Course of training.

The instruction includes:

- (1) The dressing of blisters, burns, sores, wounds; the application of fomentations, poultices, cups, and leeches.
- (2) The administration of enemias and use of catheter.
- (3) The management of appliances for uterine complaints.
- (4) The best method of friction to the body and extremities.
- (5) The management of helpless patients; making beds, moving, changing, giving baths in bed, preventing and dressing bed sores, and managing positions.
- (6) Bandaging, making bandages and rollers, lining of splints.
- (7) The preparing, cooking, and serving of delicacies for the sick.

They will also be given instruction in the best practical methods of supplying fresh air, warming and ventilating sick rooms in the proper manner, and are taught to take care of rooms and wards, to keep all utensils perfectly clean and disinfected, to make accurate observations and reports to the physician of the state of the secretions, expectoration, pulse, skin, appetite, temperature of the body, intelligence as to delirium or stupor, breathing, sleep, condition of wounds, eruptions, formation of matter, effect of diet, or of stimulants, or of medicine, and to learn the management of convalescents.

The teaching will be given by visiting or resident physicians and surgeons at the bedside of the patients, and by the superintendent. Lectures, recitations, and demonstrations will take place from time to time, and examinations at stated periods.

When the full term of two years is ended, the nurses thus trained, on passing a satisfactory examination, each receive a diploma.

Questions to be answered by candidate.

- (1) Name in full and present address of candidate.
- (2) Are you single, married, or widow?
- (3) Your present occupation or employment.
- (4) Age last birthday, and date and place of birth.
- (5) Height; weight.
- (6) Where educated.
- (7) Are you strong and healthy, and have you always been so?
- (8) Are your sight and hearing perfect?
- (9) Have you any physical defects?
- (10) Have you any tendency to pulmonary complaint?
- (11) Have you ever had any uterine disease?
- (12) If a widow, have you children? How many? Their ages. How are they provided for?
- (13) Where and what (if any) was your last situation? How long were you in it?
- (14) The names in full and addresses of two persons to be referred to. State how long each has known you. If previously employed, one of these must be the last employer.
- (15) Have you read and do you clearly understand the regulations?

Contract signed by pupil nurses on entering the school.

WASHINGTON, D. C., ———, 189—.

I, ———, the undersigned, do hereby agree to remain two years, from date, a pupil of the above-named institution, and promise during that time to obey the rules of school and hospital and to be subordinate to the authorities governing the same.



ST ELIZABETH OF HUNGARY.
(W. von Muller.)

REPORT

OF THE

BOARD OF VISITORS OF THE GOVERNMENT HOSPITAL FOR THE INSANE.

OFFICERS OF THE HOSPITAL, JUNE 30, 1898.

BOARD OF VISITORS.

Rev. BYRON SUNDERLAND, D. D.,
President of the Board.
MRS. A. M. GANGEWER.
HON. WILLIAM A. MAURY.
JOHN MOORE, M. D., U. S. A.
F. M. GUNNELL, M. D., U. S. N.

WALTER WYMAN, M. D.,
Supervising Surgeon-General M. H. S.
MRS. MARY E. FULLER.
WILLIAM W. JOHNSTON, M. D.
Rev. BENJAH L. WHITMAN, D. D.

EXECUTIVE COMMITTEE OF THE BOARD.

Messrs. GUNNELL, MOORE, and WYMAN.

CHAPLAINS.

Rev. JOHN CHESTER, D. D.
Rev. WILLIAM E. PARSON, D. D.
Rev. W. G. DAVENPORT.

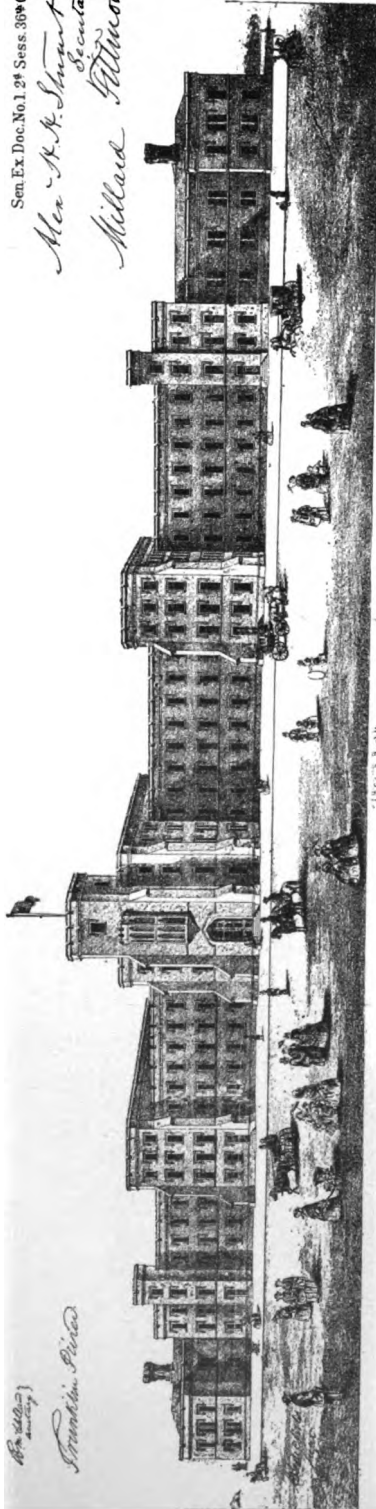
Rev. M. P. SULLIVAN.
Rev. HUGH T. STEVENSON.

MEDICAL OFFICERS.

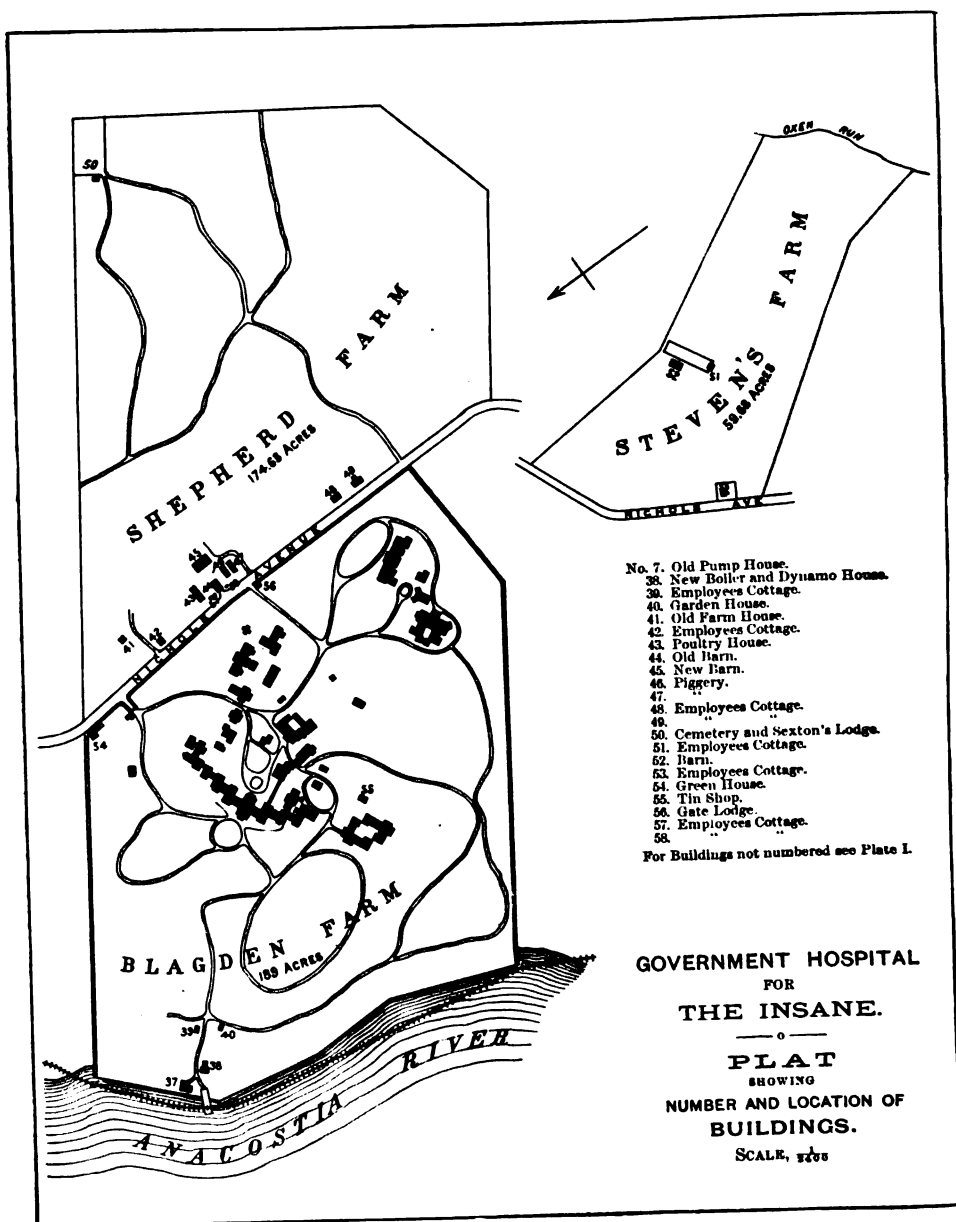
W. W. GODDING, M. D., *Superintendent and ex officio Secretary of the Board of Visitors.*
A. H. WITMER, M. D., *First Assistant Physician, in charge of Female Department.*
M. J. STACK, M. D., *Second Assistant Physician, in charge of Male Department.*
J. C. SIMPSON, M. D., *Third Assistant Physician, in charge of Detached Buildings.*
C. H. LATIMER, M. D., *Fourth Assistant Physician, in charge of Howard Hall.*
G. W. FOSTER, M. D., *Fifth Assistant Physician, in charge of Toner Building.*
I. W. BLACKBURN, M. D., *Special Pathologist.*
J. E. TONER, M. D., *Night Medical Supervisor.*
A. D. WEAKLEY, D. D. S., *Dentist.*

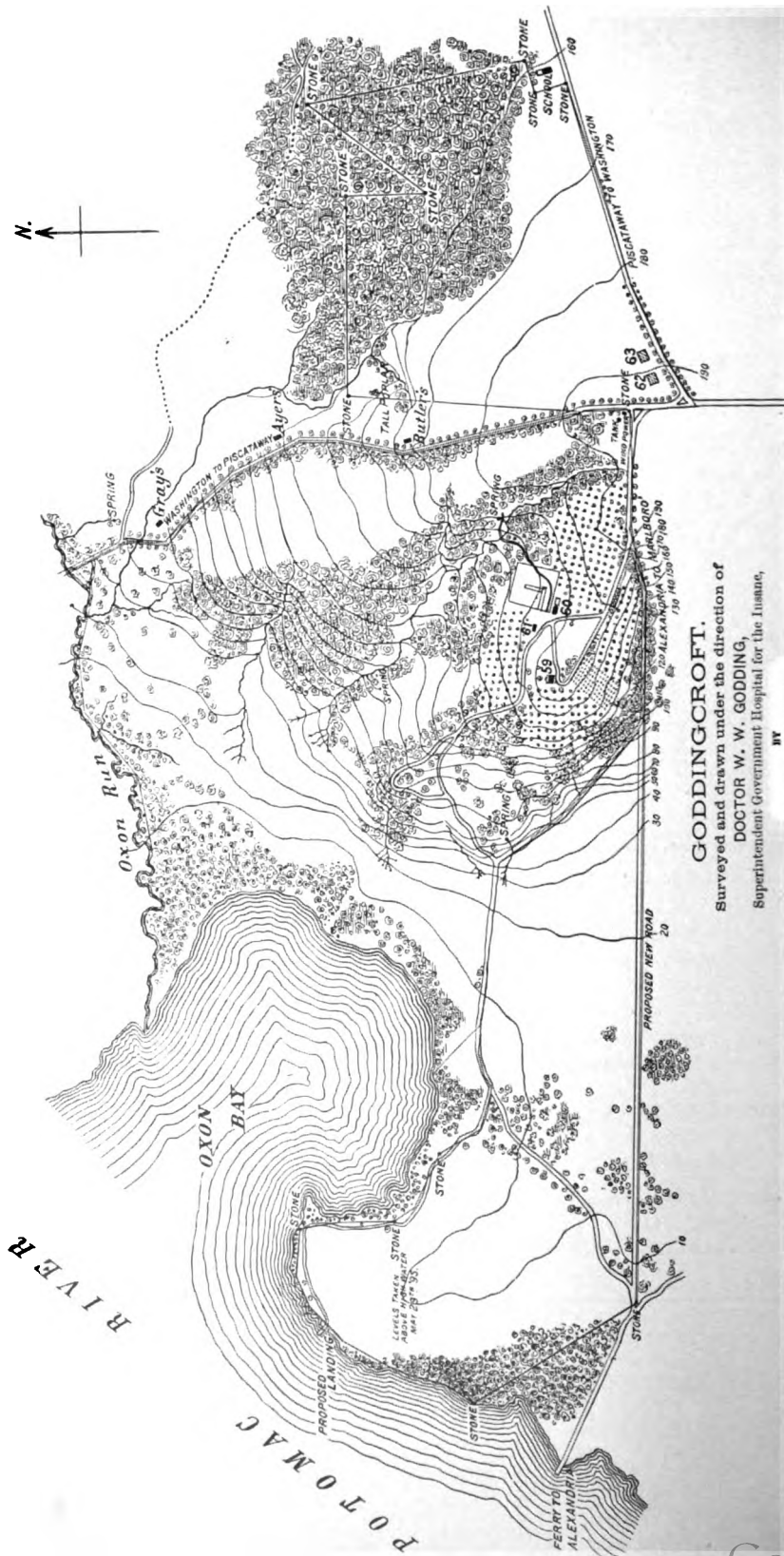
Franklin Pierce

Sen. Ex. Doc. No. 1, 2^d Sess. 36th Cong.
Wm. A. R. Stewart
Secretary
Millard Fillmore



HOSPITAL FOR THE INSANE OF THE ARMY AND NAVY AND THE DISTRICT OF COLUMBIA





GODDINGCROFT.
 Surveyed and drawn under the direction of
 DOCTOR W. W. GODDING,
 Superintendent Government Hospital for the Insane,

BY
JAMES E. WILSON,
 First Lieut. U. S. Army, Retired.

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REPORT OF THE BOARD OF VISITORS.

DEPARTMENT OF THE INTERIOR,
GOVERNMENT HOSPITAL FOR THE INSANE,
Washington, D. C., August 30, 1898.

SIR: The Board of Visitors of the Government Hospital for the Insane respectfully submit this their forty-third annual report.

The following tables present the statistics of the hospital for the fiscal year ended June 30, 1898:

SUMMARY.

	Males.	Females.	Total.
Remaining June 30, 1897.....	1,367	400	1,767
Admitted during the year ended June 30, 1898.....	347	90	437
Whole number under treatment.....	1,714	490	2,204
Discharged:			
Recovered.....	81	12	93
Improved.....	30	19	49
Unimproved.....	8	1	9
Not insane.....	3	.....	3
Died.....	167	80	197
Total discharged and died.....	289	62	351
Remaining June 30, 1898.....	1,425	498	1,853

Admissions and discharges.

		Males.		Females.		Totals.	
REMAINING JUNE 30, 1897.							
Army.....	{White	711	732	1	1	733	
	{Colored	21		.....		
Navy	{White	76	79			79	
	{Colored	3					
Marine-Hospital Service.....	{White	20	25			25	
	{Colored	5					
Civil life.....	{White	368	531	259	399	400	930
	{Colored	163		140			
			1,367				1,767
ADMITTED DURING THE YEAR 1897-98.							
Army.....	{White	110	117			117	
	{Colored	7					
Navy	{White	29	29			29	
	{Colored .....	.....				
Marine-Hospital Service	{White	6	6			6	
	{Colored .....	.....				
Civil life.....	{White	122	195	60	90	90	285
	{Colored	73		30			
			347				437
						859	

Admissions and discharges—Continued.

		Males.		Females.		Totals.	
UNDER TREATMENT DURING THE YEAR.							
Army.....	{ White	821	849	1	1	850	
	{ Colored	28					
Navy	{ White	105	108			108	
	{ Colored	3					
Marine-Hospital Service.....	{ White	26	31			31	
	{ Colored	5					
Civil life.....	{ White	490	726	319	490	1,215	2,204
	{ Colored	236		170			
			1,714				
DISCHARGED DURING THE YEAR—RECOVERED.							
Army.....	{ White	22	23			23	
	{ Colored	1					
Navy	{ White	3	4			4	
	{ Colored	1					
Marine-Hospital Service.....	{ White	1	2			2	
	{ Colored	1					
Civil life.....	{ White	84	52	11	12	64	93
	{ Colored	18		1			
			81				
DISCHARGED DURING THE YEAR—IMPROVED.							
Army.....	{ White	8	8			8	
	{ Colored						
Navy	{ White						
	{ Colored						
Marine-Hospital Service.....	{ White						
	{ Colored						
Civil life.....	{ White	18	22	15	19	41	49
	{ Colored	4		4			
			30				
DISCHARGED DURING THE YEAR—UNIMPROVED.							
Army.....	{ White	1	1			1	
	{ Colored						
Navy	{ White						
	{ Colored						
Marine-Hospital Service.....	{ White						
	{ Colored						
Civil life.....	{ White	5	7	1	1	8	9
	{ Colored	2					
			8				
DISCHARGED DURING THE YEAR—NOT INSANE.							
Army.....	{ White						
	{ Colored						
Navy	{ White						
	{ Colored						
Marine-Hospital Service.....	{ White						
	{ Colored						
Civil life.....	{ White	3	3			3	
	{ Colored						

Admissions and discharges—Continued.

		Males.			Females.			Totals.	
DECEASED DURING THE YEAR.									
Army	{ White	89	95					95	
	{ Colored	6							
Navy	{ White	12	13					13	
	{ Colored	1							
Marine-Hospital Service	{ White	2	3					3	
	{ Colored	1							
Civil life	{ White	26	56		18	30		86	
	{ Colored	30			12				
			167				30		197
REMAINING JUNE 30, 1898.									
Army	{ White	701	722		1			723	
	{ Colored	21							
Navy	{ White	90	91			1		91	
	{ Colored	1							
Marine-Hospital Service	{ White	23	26					26	
	{ Colored	8							
Civil life	{ White	403	586		274			1,013	
	{ Colored	183			153				
			1,425				427		1,858

The patients from civil life remaining June 30, 1898, are classified as follows:

	Males.	Females.	Total.
District of Columbia, transient	88	25	113
District of Columbia, resident indigent	396	391	787
United States convicts and criminals	98	11	109
Private patients	4		4
Total	586	427	1,013

Monthly changes of population.

Date.	Admitted.			Discharged.						Total discharges, including deaths.	
	Males.	Females.	Total.	Males.	Females.	Total.	Died.				
							Males.	Females.	Total.		
1897.											
July	32	7	39	16	3	19	8	1	9	28	
August	20	7	27	3	.....	3	12	4	16	19
September	24	.	31	8	1	9	14	4	18	27	
October	37	9	46	11	4	15	13	.....	13	28
November	30	3	33	15	6	21	15	1	16	37	
December	24	5	29	8	2	10	12	3	15	25	
1898.											
January	16	8	24	7	6	13	15	2	17	30	
February	23	6	29	4	5	9	22	4	26	35	
March	65	15	80	6	2	8	15	5	20	28	
April	20	6	26	15	.....	15	18	1	19	34
May	21	11	32	10	3	13	12	2	14	27	
June	35	6	41	19	.....	19	11	8	14	33
Total	347	90	437	122	32	154	167	30	197	851	

Cause of death.

Apoplexy	18	Gastritis, chronic	1
Aneurism of aorta.....	1	Hæmatoma of dura mater	1
Asphyxia	1	La grippe	3
Bright's disease, chronic	8	Lepto-meningitis.....	1
Bronchitis, chronic	3	Myocarditis	1
Cardiac hypertrophy	2	Cedema of the brain.....	6
Cardiac valvular disease	13	Organic disease of brain.....	32
Convulsions, epileptic	8	Phthisis	19
Convulsions, epileptiform	8	Paresis	17
Convulsions, apoplectiform	2	Pneumonia.....	5
Colitis	1	Senectus	8
Carcinoma	2	Strangulation (suicide).....	3
Cystitis	1	Septicæmia	2
Cerebritis, acute	1	Sarcoma	1
Diarrhœa, chronic	5	Tumor, intracranial	1
Drowning.....	1	Toxæmia, malarial	10
Exhaustion and inanition	1	Thrombosis of intracranial arteries	2
Exhaustion from acute mania	6		
Gangrene of foot	1	Total	197
Gastric ulcer	1		

Duration of mental disease of those who died.

Two weeks	1	Sixteen years	7
One month	2	Seventeen years	3
Two months	4	Eighteen years	1
Three months	1	Nineteen years	1
Four months	4	Twenty-one years	3
Five months	1	Twenty-two years	1
Six months	5	Twenty-three years	2
Seven months	3	Twenty-four years	1
Eight months	5	Twenty-five years	1
One year.....	28	Twenty-six years	1
Two years	29	Twenty-seven years	1
Three years	17	Twenty-eight years	2
Four years	22	Twenty-nine years	1
Five years	8	Thirty-one years	1
Six years	9	Thirty-two years	3
Seven years	4	Thirty-three years	3
Eight years	3	Thirty-four years	1
Nine years	7	Thirty-five years	1
Ten years	2	Thirty-six years	1
Twelve years	3	Thirty-seven years	1
Thirteen years	1		
Fifteen years	2	Total	197

Duration of mental disease, on admission, of those who recovered.

Under 10 days	6	Between 6 and 8 months	16
Between 10 and 20 days	6	Between 1 and 2 years	10
Between 20 and 30 days	21	Over 2 years	4
Between 1 and 2 months	13		
Between 2 and 3 months	15	Total	93
Between 3 and 4 months	2		

Duration of disease on admission.

		Males.			Females.			Totals.	
LESS THAN SIX MONTHS.									
Army.....	{ White	30	32					32	
	{ Colored	2							
Navy	{ White	11	11					11	
	{ Colored								
Marine-Hospital Service.....	{ White	6	6					6	
	{ Colored								
Civil life	{ White	50	90		20	39		129	178
	{ Colored	40			19				
LESS THAN ONE YEAR.									
Army.....	{ White	9	10					10	
	{ Colored	1							
Navy	{ White	2	2					2	
	{ Colored								
Marine-Hospital Service.....	{ White								
	{ Colored								
Civil life	{ White	14	26		4	6		32	44
	{ Colored	12			2				
ONE OR TWO YEARS.									
Army.....	{ White	43	46					46	
	{ Colored	8							
Navy	{ White	15	15					15	
	{ Colored								
Marine-Hospital Service.....	{ White								
	{ Colored								
Civil life	{ White	27	39		10	15		54	115
	{ Colored	12			5				
OVER TWO YEARS.									
Army.....	{ White	9	10					10	
	{ Colored	1							
Navy.....	{ White								
	{ Colored								
Marine-Hospital Service.....	{ White								
	{ Colored								
Civil life	{ White	4	5		1	1		6	16
	{ Colored	1							
OVER THREE YEARS.									
Army	{ White	9	9					9	
	{ Colored								
Navy.....	{ White								
	{ Colored								
Marine-Hospital Service.....	{ White								
	{ Colored								
Civil life	{ White	6	8		4	4		12	21
	{ Colored	2							
			17			4			

Duration of disease on admission—Continued.

		Males.		Females.		Totals.	
OVER FOUR YEARS.							
Army.....	{ White.....	1					
	{ Colored.....		1				1
Navy.....	{ White.....						
	{ Colored.....						
Marine-Hospital Service.....	{ White.....						
	{ Colored.....						
Civil life.....	{ White.....	1		2			
	{ Colored.....						
			1		2	2	3
				2			4
FIVE TO TEN YEARS.							
Army.....	{ White.....	7					
	{ Colored.....		7				7
Navy.....	{ White.....	1					
	{ Colored.....		1				1
Marine-Hospital Service.....	{ White.....						
	{ Colored.....						
Civil life.....	{ White.....	7		15			
	{ Colored.....	3					
			10		15	25	33
				18		15	
TEN TO TWENTY YEARS.							
Army.....	{ White.....	2					
	{ Colored.....		2				2
Navy.....	{ White.....						
	{ Colored.....						
Marine-Hospital Service.....	{ White.....						
	{ Colored.....						
Civil life.....	{ White.....	6		2			
	{ Colored.....	1		3			
			7		5	12	14
				9		5	
OVER TWENTY YEARS.							
Army.....	{ White.....						
	{ Colored.....						
Navy.....	{ White.....						
	{ Colored.....						
Marine-Hospital Service.....	{ White.....						
	{ Colored.....						
Civil life.....	{ White.....	5		2			
	{ Colored.....	2		1			
			7		3	10	10
				7		3	
NOT INSANE.							
Army.....	{ White.....						
	{ Colored.....						
Navy.....	{ White.....						
	{ Colored.....						
Marine-Hospital Service.....	{ White.....						
	{ Colored.....						
Civil life.....	{ White.....	2					
	{ Colored.....						
			2			2	2
				2			

Nativity, as far as could be ascertained, of the 10,772 cases treated.

Native born.	Number.	Foreign born.	Number.
District of Columbia.....	1,332	Ireland.....	1,808
New York.....	742	Germany.....	1,242
Maryland.....	847	England.....	250
Virginia.....	1,038	France.....	76
Pennsylvania.....	575	Canada.....	94
Ohio.....	366	Scotland.....	86
Massachusetts.....	239	Switzerland.....	48
Maine.....	107	Italy.....	47
Illinois.....	119	Denmark.....	32
Connecticut.....	81	Norway.....	33
New Hampshire.....	73	Sweden.....	41
Indiana.....	122	Poland.....	19
Kentucky.....	103	Prussia.....	16
Michigan.....	56	Panama.....	1
New Jersey.....	95	Russia.....	24
Tennessee.....	60	Austria.....	27
Wisconsin.....	43	Nova Scotia.....	17
Vermont.....	49	Spain.....	7
Missouri.....	54	Holland.....	12
Rhode Island.....	35	Wales.....	16
Delaware.....	21	Portugal.....	5
North Carolina.....	61	Hungary.....	7
Alabama.....	27	Mexico.....	8
South Carolina.....	24	Saxony.....	6
Iowa.....	16	Malta.....	3
Georgia.....	43	Belgium.....	5
Mississippi.....	30	Buenos Ayres.....	3
Louisiana.....	21	Brazil.....	1
West Virginia.....	33	Costa Rica.....	1
Kansas.....	7	Bavaria.....	10
Florida.....	10	Sicily.....	2
Texas.....	16	British Columbia.....	1
California.....	12	British Possessions.....	1
Indian Territory.....	9	East Indies (British).....	6
Colorado.....	2	West Indies (British).....	7
Arkansas.....	9	New Brunswick.....	3
Montana.....	1	Cuba.....	2
Oregon.....	1	China.....	1
Minnesota.....	4	Sandwich Islands.....	1
Dakota.....	4	Coast of Africa.....	2
Utah.....	1	Cyprus.....	1
Nebraska.....	1	Greece.....	4
		Turkey.....	2
		New Granada.....	1
		West Indies (Haiti).....	1
		Japan.....	3
		Newfoundland.....	1
		Bermuda Islands.....	1
		Finland.....	2
		Alsace.....	1
		Roumania.....	1
		Armenia.....	1
		Prince Edward Island.....	1
		Bahama Islands.....	1
Total.....	6,492	Total.....	3,992

RECAPITULATION.

Native born.....	6,492
Foreign born.....	3,992
Unknown.....	288
Total.....	10,772

INT 98—MIS—55

Form of disease in those admitted.

Disease.	Total past year.	Admitted during year.	Total.
Mania, acute.....	2,872	102	2,974
Mania, chronic.....	1,430	19	1,449
Melancholia.....	2,136	144	2,280
Dementia.....	2,411	89	2,500
Dementia, senile.....	403	33	436
Paresis.....	348	24	372
Typhomania (Bell's disease).....	2	.....	2
Diffuse suppurative meningitis.....	1	.....	1
Dipsomania.....	459	6	465
Kleptomania.....	4	.....	4
Nymphomania.....	4	.....	4
Imbecility.....	200	15	215
Opium eaters.....	21	.....	21
Idiocy.....	8	1	4
Primary delusional insanity.....	1	.....	1
Chronic delusional insanity.....	15	1	16
Toxic insanity.....	2	1	3
Not insane.....	23	2	25
Total.....	10,835	347	10,772

Time of life at which the 10,772 cases treated since the opening of the institution became insane.

	Previous to 1897.	1898.	Total.
Under 10 years.....	278	19	297
Between 10 and 15 years.....	104	4	108
Between 15 and 20 years.....	514	18	532
Between 20 and 25 years.....	1,462	54	1,516
Between 25 and 30 years.....	1,632	52	1,684
Between 30 and 35 years.....	1,408	39	1,447
Between 35 and 40 years.....	1,105	87	1,192
Between 40 and 45 years.....	869	36	905
Between 45 and 50 years.....	756	29	785
Between 50 and 60 years.....	1,030	78	1,108
Between 60 and 70 years.....	653	39	692
Between 70 and 80 years.....	276	26	302
Between 80 and 90 years.....	39	4	43
Over 90 years.....	3	.....	3
Unknown.....	183	.....	183
Not insane.....	23	2	25
Total.....	10,335	437	10,772

Private patients.

	Males.	Females.	Total.
There were at the beginning of year.....	3	.....	3
Admitted during the year.....	1	.....	1
Whole number under treatment.....	4	.....	4
Remaining at end of year.....	4	.....	4

Summary of total admissions.

	Males.	Females.	Total.
	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per ct.</i>
Cases recovered.....	34.27	24.00	33.28
Cases improved.....	15.07	20.83	18.26
Cases unimproved.....	2.08	3.54	2.39
Cases died.....	31.90	31.73	31.87
Cases remaining.....	16.68	19.21	17.20
	100	100	100

Admissions, discharges, and deaths, with the mean annual mortality and proportion of recoveries, per cent of the discharges, including deaths, for each year since the opening of the hospital.

Year.	Admitted.			Recovered.			Discharged.			Died.			Remaining June 30 in each year.			Daily average.			Percentage of recoveries on discharges.			Percentage of deaths on average numbers.			Percentage of deaths on total number.		
	M.	F.	To- tal.	M.	F.	To- tal.	M.	F.	To- tal.	M.	F.	To- tal.	M.	F.	To- tal.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.
1855-56.....	26	37	63	3	5	8	3	5	8	5	3	8	26	34	60	19.35	20.65	40.00	100.00	100.00	100.00	70.13	37.50	107.63	7.09	10.10	17.19
1856-57.....	36	11	47	3	2	5	3	2	5	3	2	5	54	39	93	41.20	37.98	70.13	33.33	35.71	34.52	16.66	14.66	15.66	10.13	12.13	11.13
1857-58.....	25	27	52	4	4	8	4	6	10	7	6	13	59	50	109	54.40	42.80	97.20	44.44	44.44	44.44	16.66	14.66	15.66	10.13	12.13	11.13
1858-59.....	29	14	43	13	5	18	1	1	2	2	2	4	55	52	107	57.70	50.31	108.01	55.55	55.55	55.55	11.11	11.11	11.11	7.95	9.37	8.55
1859-60.....	47	18	65	26	7	33	4	5	9	3	5	8	84	54	138	123.17	57.13	180.30	31.25	47.73	71.11	31.25	47.73	71.11	7.74	5.49	6.61
1860-61.....	68	24	92	26	7	33	4	5	9	3	5	8	105	61	166	100.00	58.50	158.50	62.50	62.50	62.50	15.15	15.15	15.15	8.47	11.27	9.87
1861-62.....	64	31	95	42	11	53	5	2	7	2	2	4	109	76	185	109.76	64.81	174.57	68.85	68.85	68.85	17.45	17.45	17.45	7.06	7.61	7.82
1862-63.....	174	12	186	96	8	104	14	1	15	2	2	4	167	65	232	123.75	65.74	189.49	70.59	70.59	70.59	42.10	42.10	42.10	9.18	11.90	9.81
1863-64.....	330	25	355	197	6	203	17	1	18	3	3	6	203	76	279	168.41	72.31	240.72	71.89	71.89	71.89	42.10	42.10	42.10	11.95	14.44	10.76
1864-65.....	484	25	509	282	6	288	69	1	70	5	5	10	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1865-66.....	478	36	514	315	9	324	110	12	122	11	11	22	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1866-67.....	194	28	222	104	5	109	20	7	27	10	10	20	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1867-68.....	88	21	109	45	7	52	11	3	14	11	11	22	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1868-69.....	133	35	168	59	11	70	9	6	15	8	8	16	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1869-70.....	146	36	182	32	8	40	16	8	24	11	11	22	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1870-71.....	161	34	195	50	12	62	21	7	28	4	4	8	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1871-72.....	142	44	186	43	8	51	16	13	29	8	8	16	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1872-73.....	153	51	204	49	15	64	23	5	28	3	3	6	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1873-74.....	192	38	230	67	12	79	22	8	30	6	6	12	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1874-75.....	179	51	230	66	9	75	28	10	36	1	1	2	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1875-76.....	166	47	213	67	17	84	26	10	36	1	1	2	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1876-77.....	147	51	198	66	17	83	27	13	40	2	2	4	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1877-78.....	138	44	182	49	11	60	32	9	41	3	3	6	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1878-79.....	169	53	222	68	14	82	30	7	37	3	3	6	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1879-80.....	181	44	225	68	24	92	30	10	37	3	3	6	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1880-81.....	161	62	223	62	10	72	27	9	36	2	2	4	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1881-82.....	178	69	247	62	21	83	31	8	39	2	2	4	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1882-83.....	201	64	265	76	19	95	33	16	49	3	3	6	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1883-84.....	286	64	350	68	13	81	35	8	43	3	3	6	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1884-85.....	229	91	320	65	24	89	37	12	49	1	1	2	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1885-86.....	234	69	303	55	22	77	58	17	75	2	2	4	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1886-87.....	206	62	268	57	15	72	49	17	66	2	2	4	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1887-88.....	247	71	318	59	10	69	52	14	66	3	3	6	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1888-89.....	273	67	340	50	20	70	27	27	54	5	5	10	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1889-90.....	214	71	285	39	6	45	43	7	50	2	2	4	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76
1890-91.....	271	81	352	36	30	66	38	15	53	1	1	2	167	96	263	205.73	77.66	283.39	66.66	66.66	66.66	40.00	40.00	40.00	11.95	14.44	10.76

Admissions, discharges, and deaths, with the mean annual mortality and proportion of recoveries, per cent of the discharges, including deaths, for each year since the opening of the hospital—Continued.

Year.	Admitted.			Discharged.						Remaining June 30 in each year.			Daily average.			Percentage of recoveries on discharges.			Percentage of deaths on average numbers.			Percentage of deaths on total number.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	Recovered.			Improved.			Unimproved.			Died.			Remaining June 30 in each year.			Daily average.			Percentage of recoveries on discharges.			Percentage of deaths on average numbers.			Percentage of deaths on total number.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.		F.	M.</	

History of the annual admissions since the opening of the hospital, with discharges and deaths, and number for each year remaining June 30, 1898.

Year.	Admitted.			Of each year's discharged and died in 1898.						Total discharged and died of each year's admissions.						Remaining of each year's admissions, June 30, 1898.	
	New cases.			Recovered.			Unimproved.			Improved.			Unimproved.				
	Relapsed cases.			Total.													
	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.
1855	26	37	63							1	3	4	1	1	2	2	1
1856	26	11	37							2	15	17	2	1	3	28	4
1857	24	25	49							3	6	9	3	3	6	22	4
1858	27	11	38							2	14	16	2	3	5	13	8
1859	44	15	59							4	20	24	4	4	8	24	1
1860	47	16	63							17	17	34	8	4	12	26	1
1861	60	19	79							9	25	34	9	2	11	44	4
1862	60	30	90							15	45	60	11	3	14	54	2
1863	172	11	183							38	15	53	5	3	8	118	3
1864	322	18	340							132	12	144	13	1	14	227	2
1865	322	23	345							233	4	237	24	4	28	321	3
1866	452	22	474							304	8	312	36	7	43	438	5
1867	452	24	476							299	7	306	69	7	76	401	7
1868	452	24	476							299	7	306	69	7	76	401	7
1869	452	24	476							299	7	306	69	7	76	401	7
1870	452	24	476							299	7	306	69	7	76	401	7
1871	452	24	476							299	7	306	69	7	76	401	7
1872	452	24	476							299	7	306	69	7	76	401	7
1873	452	24	476							299	7	306	69	7	76	401	7
1874	452	24	476							299	7	306	69	7	76	401	7
1875	452	24	476							299	7	306	69	7	76	401	7
1876	452	24	476							299	7	306	69	7	76	401	7
1877	452	24	476							299	7	306	69	7	76	401	7
1878	452	24	476							299	7	306	69	7	76	401	7
1879	452	24	476							299	7	306	69	7	76	401	7
1880	452	24	476							299	7	306	69	7	76	401	7
1881	452	24	476							299	7	306	69	7	76	401	7
1882	452	24	476							299	7	306	69	7	76	401	7
1883	452	24	476							299	7	306	69	7	76	401	7
1884	452	24	476							299	7	306	69	7	76	401	7
1885	452	24	476							299	7	306	69	7	76	401	7
1886	452	24	476							299	7	306	69	7	76	401	7
1887	452	24	476							299	7	306	69	7	76	401	7
1888	452	24	476							299	7	306	69	7	76	401	7
1889	452	24	476							299	7	306	69	7	76	401	7
1890	452	24	476							299	7	306	69	7	76	401	7

History of the annual admissions since the opening of the hospital, with discharges and deaths, and number for each year remaining June 30, 1898—Cont'd.

Year.	Admitted.			Of each year's discharged and died in 1898.										Total discharged and died of each year's admissions.										Remaining of each year's admissions June 30, 1898.											
	New cases.		Total.	Released cases.			Recovered.			Improved.			Unimproved.			Died.			Recovered.			Improved.					Unimproved.			Died.					
	M.	F.		M.	F.	M.	F.	To- tal.	M.	F.	To- tal.	M.	F.	To- tal.	M.	F.	To- tal.	M.	F.	To- tal.	M.	F.	To- tal.				M.	F.	To- tal.	M.	F.	To- tal.	M.	F.	To- tal.
1891-92...	218	64	303	6	15	21	303	2	2	4	1	1	2	1	3	4	50	10	60	43	19	62	5	1	6	79	30	109	55	3	58				
1892-93...	236	69	345	25	6	361	345	2	2	4	1	1	2	1	2	3	62	13	75	41	26	67	5	1	6	90	23	113	69	92	83				
1893-94...	248	82	361	25	6	361	361	2	2	4	1	1	2	1	2	3	65	18	83	45	29	74	5	1	6	97	21	118	56	27	83				
1894-95...	281	71	371	12	7	871	371	2	1	3	3	2	5	14	1	15	65	19	84	34	20	54	2	1	3	91	17	108	101	22	123				
1895-96...	246	78	324	32	14	370	324	9	2	11	1	1	2	1	3	14	60	21	81	30	27	57	6	...	6	6	14	81	30	145					
1896-97...	261	77	338	28	11	377	338	11	3	14	5	5	10	4	7	11	58	9	67	17	19	36	5	...	5	7	12	88	38	181					
1897-98...	308	76	437	39	14	437	437	43	6	49	14	11	25	5	7	57	84	12	96	14	11	25	5	1	6	50	7	57	235	65	300				
Total	7,698	1,882	10,772	846	346	10,772	10,772	84	12	96	80	19	49	8	1	9	167	30	197	2,928	550	3,478	1,749	178	79	267	2,726	707	3,433	1,423	428	1,853			

NOTE.—Of the recoveries, 3 males not insane, are included.



ST. ELIZABETH—MAIN ENTRANCE.



ST. ELIZABETH—WEST LODGE (FOR COLORED MALES), 1853 AND 1873.

A word about St. Elizabeth, whose idealized head by the German artist, W. von Miller, makes a fitting frontispiece to the report. Why is the Government Hospital for the Insane called St. Elizabeth? Briefly, it takes its name from that of the original grant of its land to the first Catholic settler of Maryland. The 400 acres which constitute the present hospital site are about a fourth part of the St. Elizabeth grant of colonial times. The names of saints are household words throughout Maryland. St. Clements, St. George, St. Mary, all testify to that early nomenclature. During the war of the rebellion the army hospital for the sick and wounded on these grounds was known as St. Elizabeth. It was discontinued in 1864, for its urgent need was over, but it had for all time given a pleasant name to the place, hiding the insanity in the title behind the mantle of a saint.

As the thirteenth century recedes the story of St. Elizabeth of Hungary comes more and more to symbolize the Divine Healer of the poor and the outcast to the hearts of men. The legends which, coming out of that twilight century, cluster around that woman's life, who passed at the age of 24 from penance and seeming madness to the aureole and the life beyond, are redolent with the compassion that is "touched with the feeling of our infirmities." The mantle torn off that the beggar might be clothed; the loaves for the poor hidden in her vest, that, rudely torn aside, disclosed a lap of roses; the washing of the beggars' feet, that gave a theme and immortal fame to Murillo; the leprous child laid upon her own bed, and when they looked the Christ Child was in its stead—what fitter Saint, what better name, than St. Elizabeth to symbolize the loving kindness that should be extended here?

No better evidence than these tables is needed to show that the United States have entered on an era of expansion. The whole number under treatment, 2,204, is nearly 100 more than that of any previous year, while the number of admissions, 437, has been exceeded only during the closing years of the civil war. The increase of the Army to a quarter of a million of men and the rapid development of the Navy since war was declared against Spain in April last explains this. Although peace is now in sight, this increase in the number of hospital inmates, out of proportion to the increment of recent years, will continue, since a considerable increase in the Army will be permanent. Moreover, the law as it now stands provides for the admission here of "indigent insane persons who have become insane within three years after their discharge from the service from causes which arose during and were produced by said service." In the period from the 21st of April to the 12th of August, 1898, the time covered by the war, 46 insane persons were admitted from the active lists of the Army and Navy, one-half of whom were from the Volunteer Army. This is against 15 received from the same source during the same period of the year 1897. An increase of admissions from this source alone of not less than 50 a year must be expected and provided for.

The daily average number of inmates during the year has been 1,798, an increase of 88 on that of the preceding year. The whole number of deaths, 197, amounts to 8.94 per cent of the whole number under treatment, which is more than 1.5 per cent above that of the previous year. This is due to the advancing age and incident infirmity of a majority of the inmates rather than to any prevailing disease, for while there has been more than a sufficiency of malarial poisoning, it has not resulted in the all-pervading sickness of some previous years. Congress has ordered a survey of the Anacostia flats, looking to their

reclamation in the near future; and, as a medicine prescribed sometimes has a salutary effect before it is taken, it may be that the hope of succor thus held out has imparted vigor to the sufferers to withstand the attack of the paludinous microbe. It is to be hoped that the good work may now progress, without interruption, to the transformation of these noisome flats into hygienic pleasure grounds for the nation's capital. If it was the boast of Augustus that "He had found Rome brick and left it marble," may it be said of the legislation of this decade that, finding Washington a miasmatic marsh, it has left it a city of salubrious homes. Such achievement would be worthy of the era of empire on which we appear to be entering.

Extensive building operations have been carried on during the year. We are at last to have, in the new laundry, whose walls are now in process of erection and whose plans have been a matter of careful study, a building which it is believed will be found ample for the important and growing work of this department.

The Dix Building No. 3, which has been completed and occupied during the year, is cheerful and pleasant, both without and within, and seems well suited for the class for which it is specially designed.

The extension to the West Lodge for colored males, for which a small appropriation was made at the close of the fiscal year 1898, is already well under way, the urgent need for further accommodations for this class requiring that the work be pushed without delay. It will afford the greatest relief.

The Allison buildings for infirm soldiers and sailors from the National Home for Disabled Volunteer Soldiers are practically completed, and will be fully occupied before the report is issued. This is a group of four buildings of the pavilion type, connected with the Relief and Home buildings, affording an indoor and outdoor provision for the sick and feeble ones (who by their advancing age are every year becoming more helpless) that is more liberal and inviting than anything that has hitherto been developed at St. Elizabeth. There is ample indoor space for 100 bedridden and feeble men, while the piazza space is actually greater than that within doors. The floors of the latter are of the same level as the dormitory floors, and the doorways wide enough to admit of the beds and couches on casters being trundled into the open air. This, for more than half the year in our climate, is a perfect luxury of shaded coolness and free ventilation. The poor veteran who, bedridden, has turned his face to the wall only to "babble a' of green fields" that he no longer sees, wheeled out on these piazzas may again associate with the trees, look into their green leaves, and lying in the morning's light drink in its reviving breeze. A little glazing may transform these same spaces into winter sun baths to rival Algeria's house tops for invalids. When outdoors means Heaven to the bedridden sufferer, why shut him out of it? These very satisfactory buildings for 100 inmates, with all their liberal provision, will be completed and furnished with the appropriation of \$75,000.

The commitment of insane persons from the District of Columbia to the Government Hospital for the Insane was for many years under the orderly proceedings laid down in United States Revised Statutes, sections 4844, 4845, and 4846, which proceedings were undoubtedly intended by the Congress which enacted those provisions to be all that was necessary to determine the insanity and provide for the care of the unfortunate sufferer. The supreme court of the District of Columbia, in their decision in re Bryant (3 Mackey Rep., 489), changed all this. Bryant was an insane man admitted under sections 4853 and 4854, but



East lodge (colored insane women), 1854 and 1887.

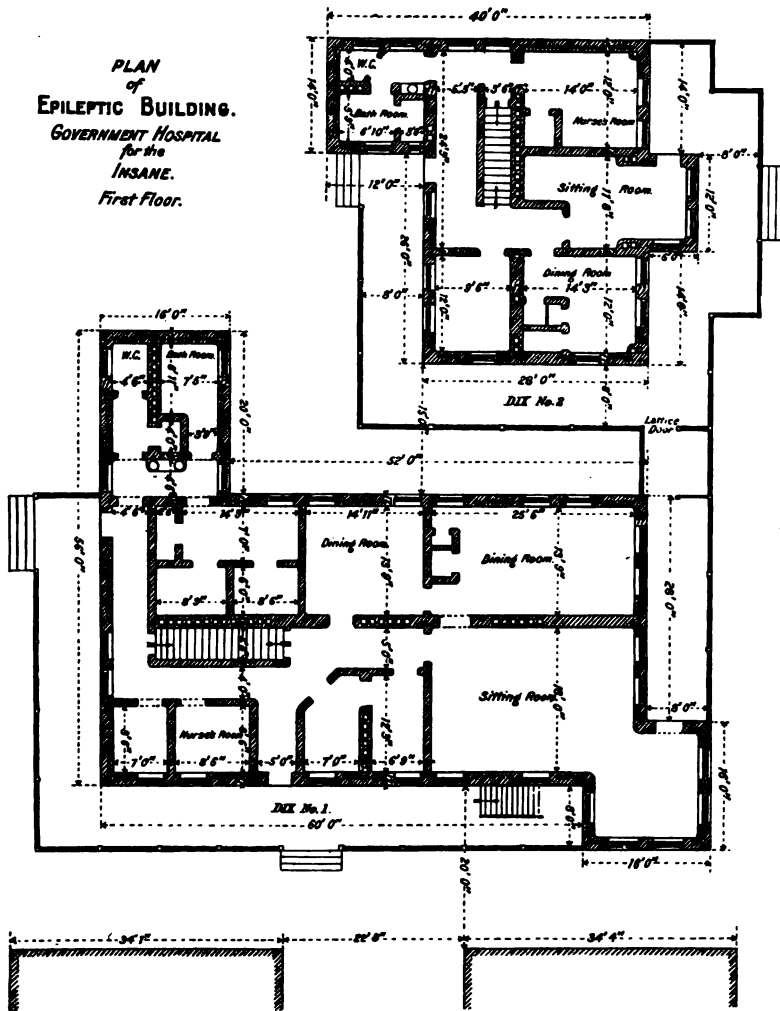
Dix Building, 1893
(female epileptic insane).

ST. ELIZABETH.



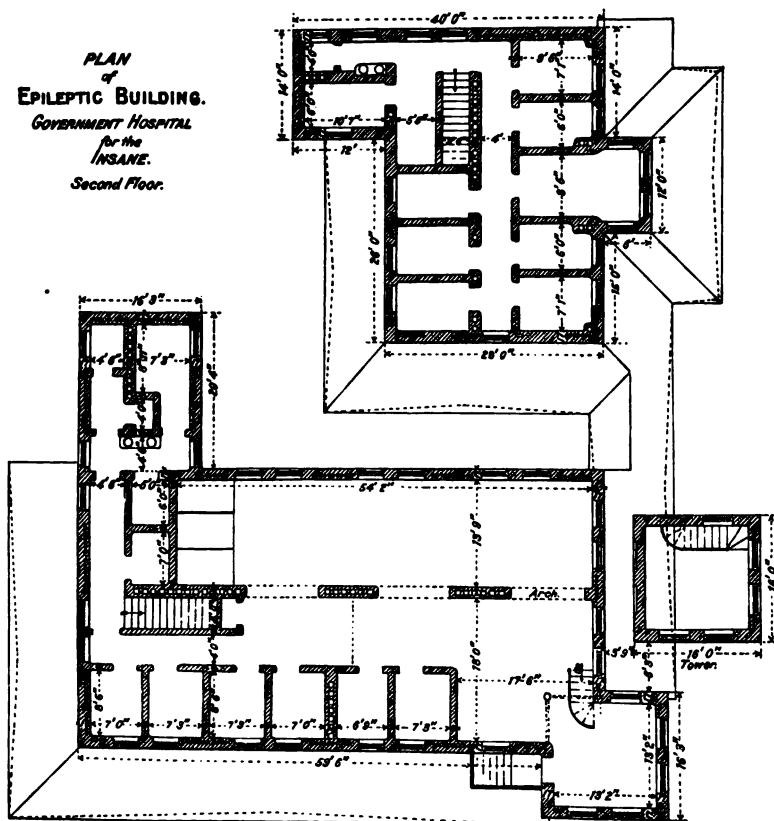
ST. ELIZABETH—GATEHOUSE AT ENTRANCE, 1874.

PLAN
of
EPILEPTIC BUILDING.
GOVERNMENT HOSPITAL
for the
INSANE.
First Floor.



FIRST-FLOOR PLAN OF DIX BUILDINGS 1 AND 2 (FEMALE EPILEPTIC WARDS), 1893.

PLAN
of
EPILEPTIC BUILDING.
GOVERNMENT HOSPITAL
for the
INSANE.
Second Floor.



Dix. Nos. 1 & 2.

SECOND-FLOOR PLAN OF DIX BUILDINGS 1 AND 2 (FEMALE EPILEPTIC WARDS), 1893.



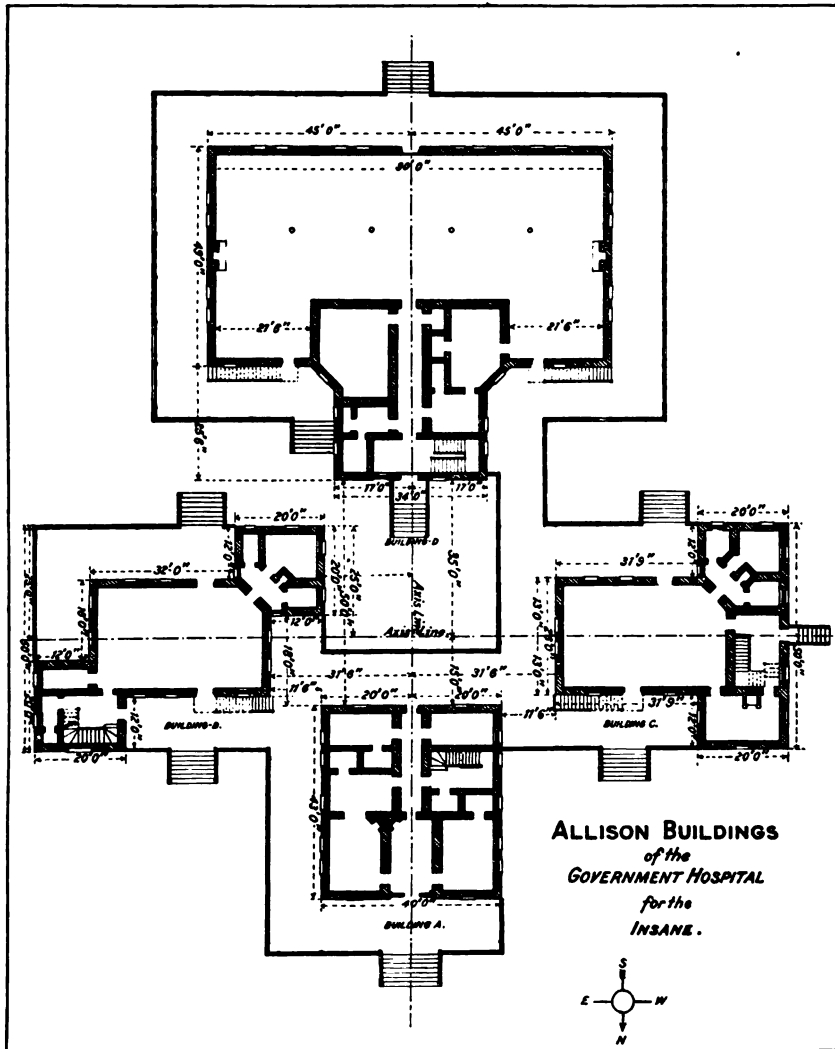
INTERIOR EAST LODGE (COLORED FEMALE WARD).



THE ALLISON BUILDINGS FOR INFIRM SOLDIERS. FRONT VIEW. 1899.



THE ALLISON BUILDINGS FOR INFIRM SOLDIERS, REAR VIEW, SHOWING PIAZZAS. 1899.



GROUND PLAN OF THE ALLISON BUILDINGS, 1899.



ST. ELIZABETH—HOWARD HALL (FOR CRIMINAL INSANE), 1887 AND 1892.



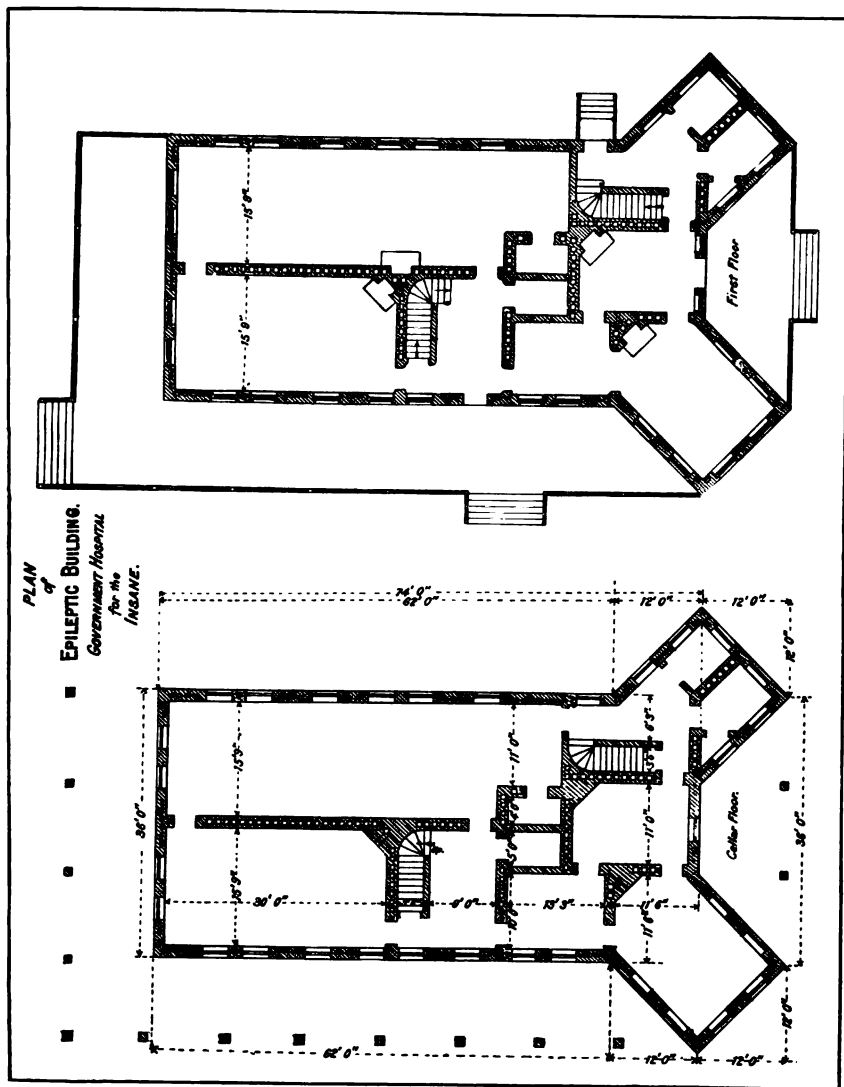
ST. ELIZABETH—TONER BUILDING. 1889-1891.



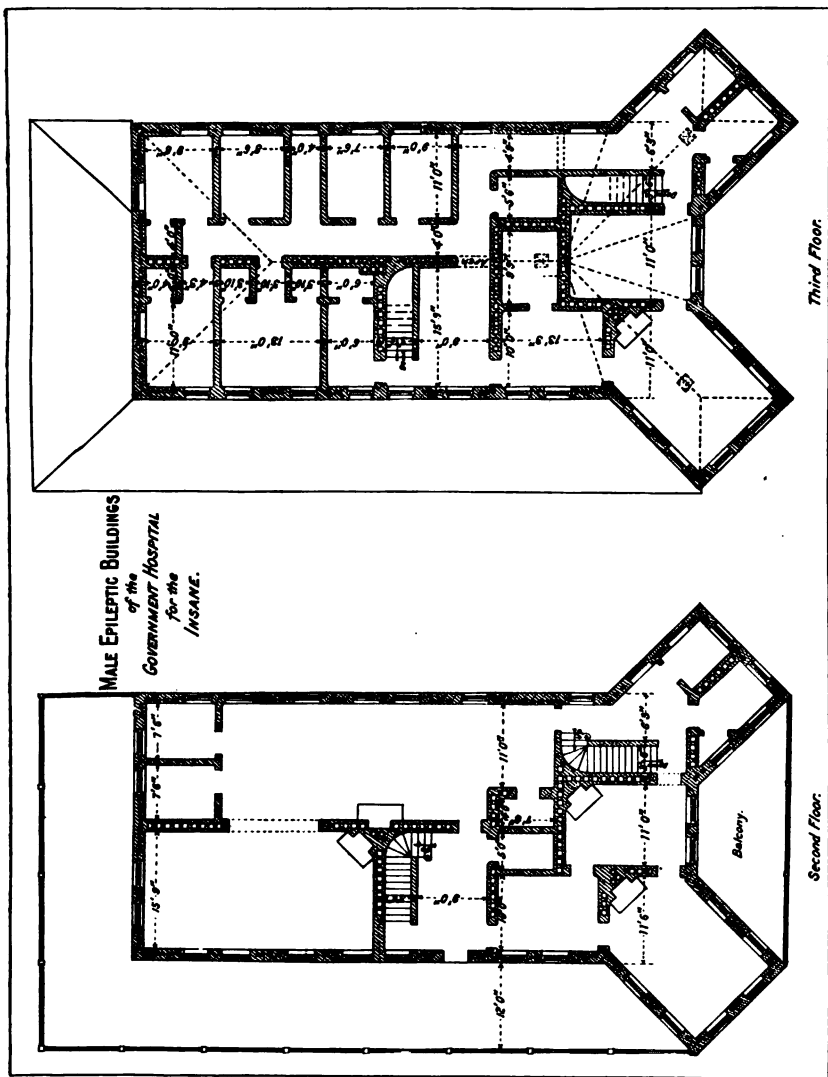
ST. ELIZABETH—STEAMER HOUSE AND CLOCK TOWER, 1890.



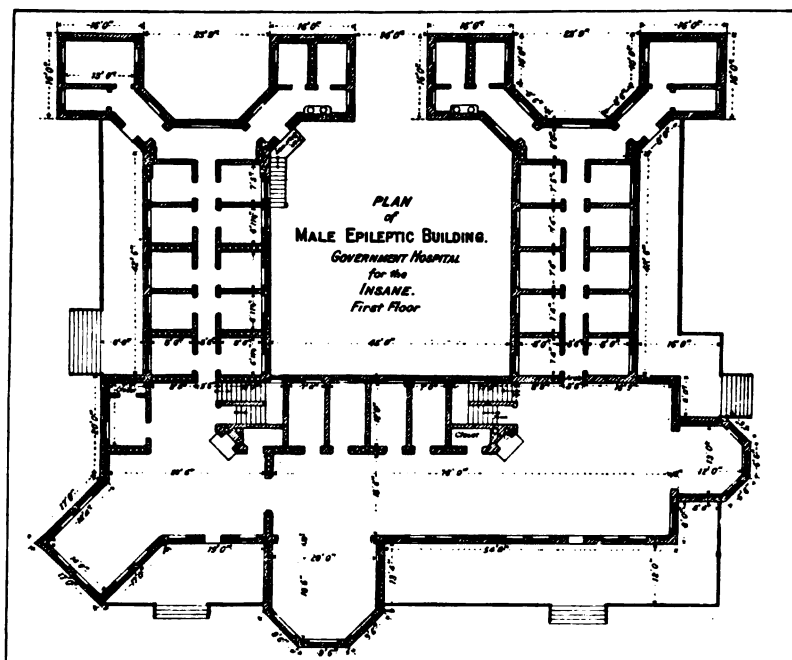
ST. ELIZABETH—"THE OAKS" (MALE EPILEPTIC BUILDING), 1895.



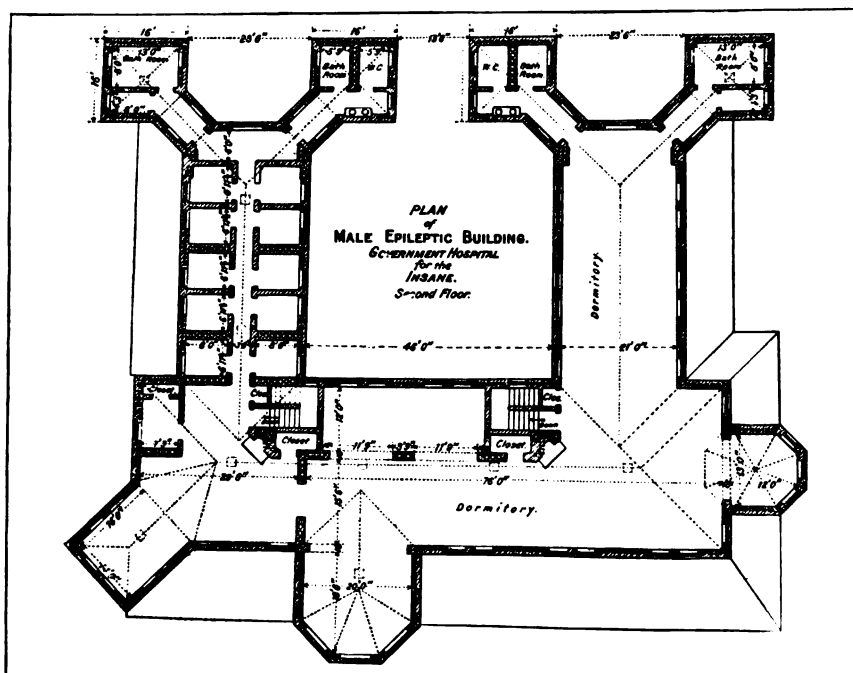
OAKS 1. PLAN (GROUND AND FIRST FLOOR).



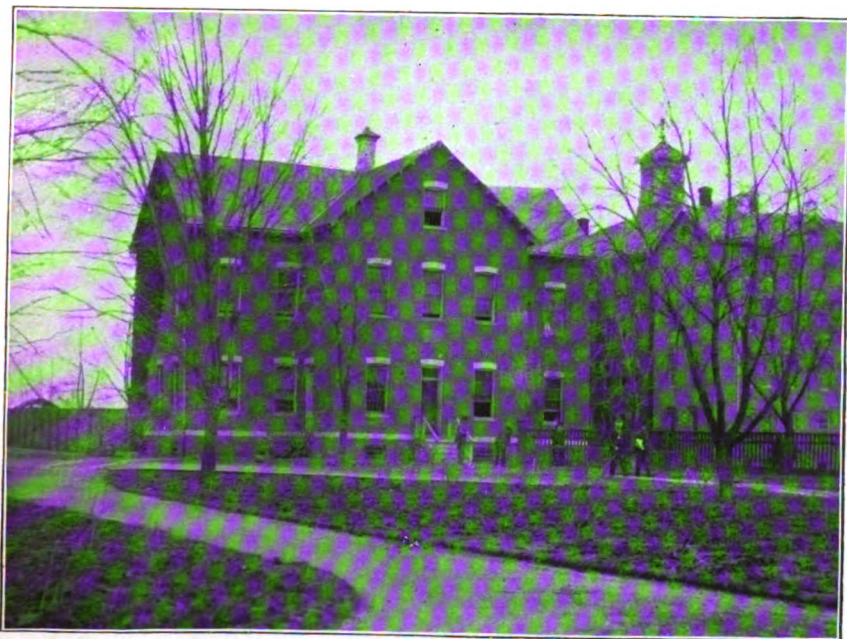
OAKS 1. PLAN (SECOND AND THIRD FLOORS).



OAKS 2. PLAN (FIRST FLOOR).



OAKS 2. PLAN (SECOND FLOOR)



ST. ELIZABETH—ATKINS HALL, 1878.



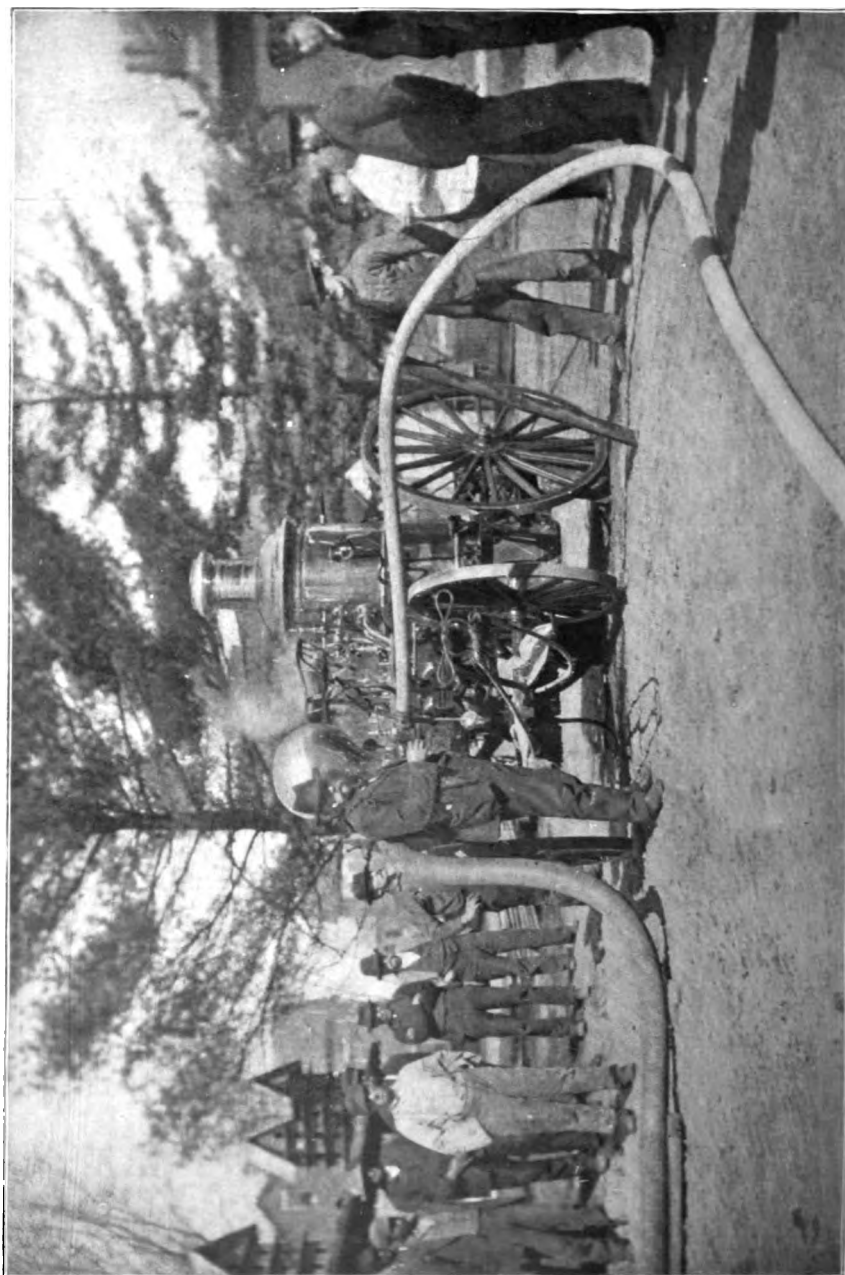
Home, 1883-84.

ST. ELIZABETH.

Relief, 1879-80.



THE BORROWS COTTAGE (PRIVATE HOME), 1891.



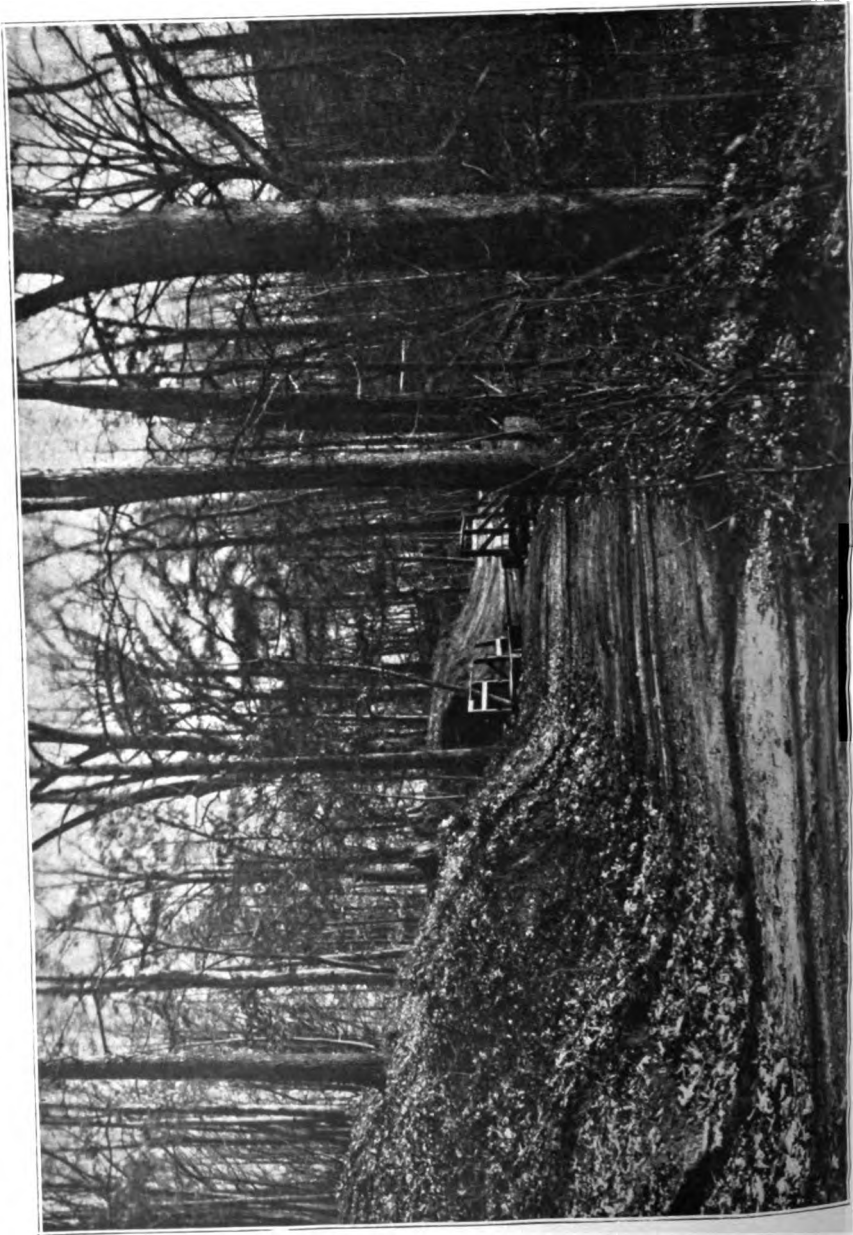
ST. ELIZABETH STEAM FIRE ENGINE.



ATKINS HALL—INTERIOR.



ST. ELIZABETH CORNET BAND.



WOOD PATH AT ST. ELIZABETH.

treatment, or at least the study of whose cases may afford some light on forms of disease that are at the best obscure. A corps of trained day and night nurses are in attendance here, and the conditions are those of a general hospital with appliances suited to the class of patients. The hydrotherapeutic apparatus of Dr. S. Baruch is here in extensive daily use, with strikingly beneficial results in many forms of chronic disease; massage, rest, food, medication; the careful study of the individual case, and persevering continuance of treatment in spite of disheartening conditions to the end of the journey or the triumphant outcome; these are the means employed. To have faith in our work and to prevail; this has enabled us to contend for years with paresis and other so-called hopeless forms of disease with a degree of success that is as gratifying as unexpected. It is for such work that this hospital has been created, and it will go on.

Other views that have been inserted in the report represents St. Elizabeth of Hungary, a fit patron saint for these afflicted ones; the farm buildings and the herd of milch cows; the entrance to the grounds, the clock tower, and steamer house with steamer itself; the cornet band, made up of employees and inmates, together with some glimpses caught by hill and stream within the inclosing walls that shut out that other world, to make for these poor ones a pleasant world within. The panorama of the city and river is most extensive, and there are some shaded nooks that are among the most beautiful about Washington. Poor and afflicted as we are we have some things to boast of; the nation's Capitol has no ivy-mantled towers and no southern magnolias that can compare with ours. Since they can not have many things, may we not ask that what they have be of the best?

Estimates for the Government Hospital for the Insane.

Deficiency, 1898: Support	\$12,003
Deficiency, 1899: Support	22,000

The estimates for the year 1898 were made in September, 1896, and were based on an average number of 1,700 of the class provided for. As a matter of fact, the average number under treatment during the year was nearly 100 in excess of the estimate, but the price of supplies was lower than the present year, and there was a hope of closing without a deficiency. But the war came on, and during the last third of the year about 20 per cent more patients were admitted than during the same months of the previous year, necessarily increasing the daily expenditure for supplies and rendering a reduction of the hospital force impracticable. The result is that \$12,003 will be needed to close the accounts for the year, which amount is asked as an urgent deficiency.

The estimates for 1899, which under the law must be made early in September of 1897, were based on a probable number of 1,725 of the class for which the appropriation was made. Before the fiscal year commenced war was declared, there was a marked advance in the price of all provisions, and an increase of nearly one hundred patients that could not have been anticipated when the estimate was made, so that on the 1st of July, the beginning of the fiscal year, the hospital was called upon to provide for 1,853 inmates. Proposals for supplies opened May 6th showed an advance in prices on the quantities estimated for the previous year of over \$10,000. These conditions are likely to continue through the year.

Estimates for the fiscal year ending June 30, 1900.

For current expenses	\$407, 000
General repairs and improvements	15, 000
Building and grounds, viz:	
Chapel building	25, 000
Slaughter house, mule stables, and cart sheds on stock farm	4, 500
Central plant for hot water piping, etc.	6, 000
Renewing plumbing and tiling baths and toilets, two sections old build- ings	5, 000
Continuing brick pavements	2, 500
Erecting three fire escapes, with standpipe and hose	2, 250
Furnishing West Lodge extension	1, 500
For fireproofing floors, brick partition and piazzas, Atkins Hall	5, 000
	51, 750
Additional accommodations, viz, cottage provision for working patients ...	31, 250

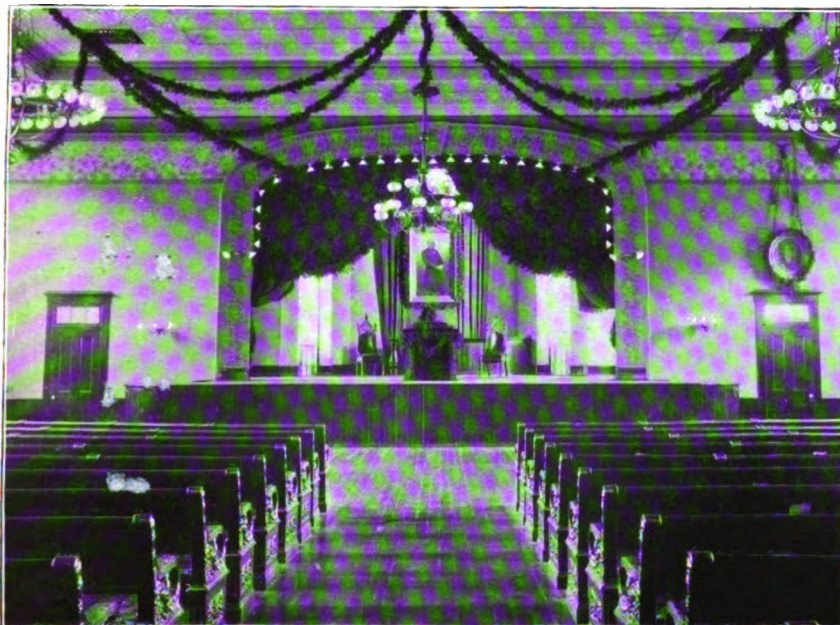
The estimate for current expenses is for support, clothing, and treatment in the Government Hospital for the Insane of the insane from the Army and Navy, Marine Corps, Revenue-Cutter Service, inmates of the National Home for Disabled Volunteer Soldiers, persons charged with or convicted of crimes against the United States who are insane, all persons who have become insane since their entry into the military and naval service of the United States who have been admitted to the hospital and who are indigent, and for the indigent insane admitted from the District of Columbia.

The basis of estimate is an annual per capita cost of \$220 for an (estimated) average number of 1,850 of the above classes.

Congress has for a number of years divided this appropriation between the sundry civil and the District bill. Following the uniform usage of years, the increase in the District bill being based on the increase in the number of District patients during the last fiscal year, the amount in that bill will be \$122,498.80, leaving \$284,505.20 to be appropriated in the sundry civil, of which sum it is asked that not exceeding \$1,500 may be used to defray the expense of the removal of patients to their friends. A section in the legislative, executive, and judicial bill approved March 15, 1898, makes necessary the further provision that not exceeding \$1,000 of the appropriation may be expended in the purchase of such books, periodicals, and papers as may be required for the purpose of the hospital.

The \$15,000 asked for general repairs and improvements is the same amount that has been appropriated for that purpose for some years past, and with the constant wear and tear incident to a large hospital and one constantly extending its buildings like this, the only question is whether the proper and necessary repairs can be made with the amount hitherto required for the purpose. Certainly, but for the fact that it will be supplemented by some special appropriations, it would be inadequate.

The sum of \$25,000 is again asked for a chapel. There is nothing to be said in addition to what has been previously adduced in its support. An institution of the size of this ought to have an amusement hall fitted for its purpose distinct from its place of worship. For more than forty years, one room, rendered more and more inadequate by each year's increase of population, has done duty for both. Solomon says "there is a time to dance," but in our assembly room, among the ponderous chapel seats, there is no room for it. Twice in the year, on New Year's and Easter Monday, the great common dining hall of the detached buildings is cleared of its tables and the inmates have a joyous dance



Portrait of Dr. Nichols.

Portrait of Miss Dix.

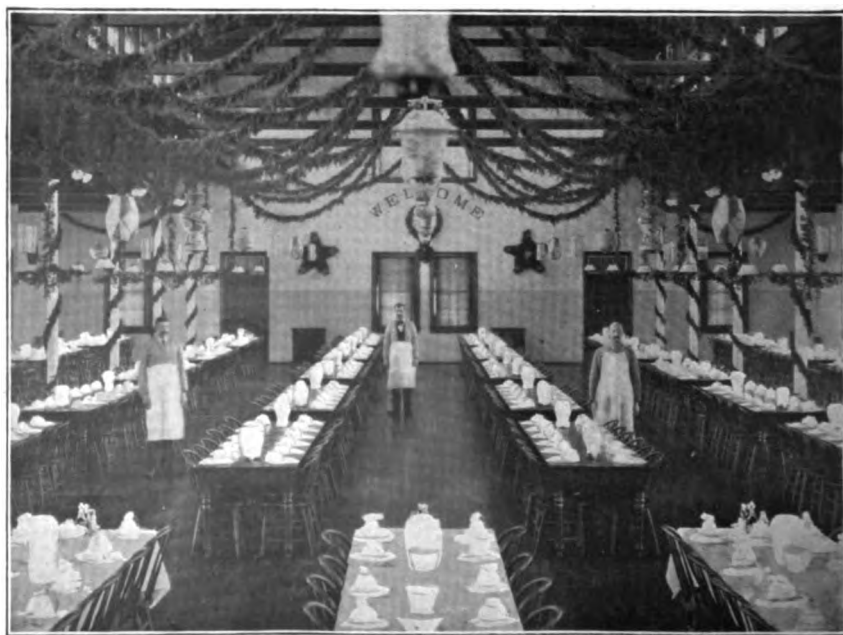
ST. ELIZABETH—ASSEMBLY ROOM.



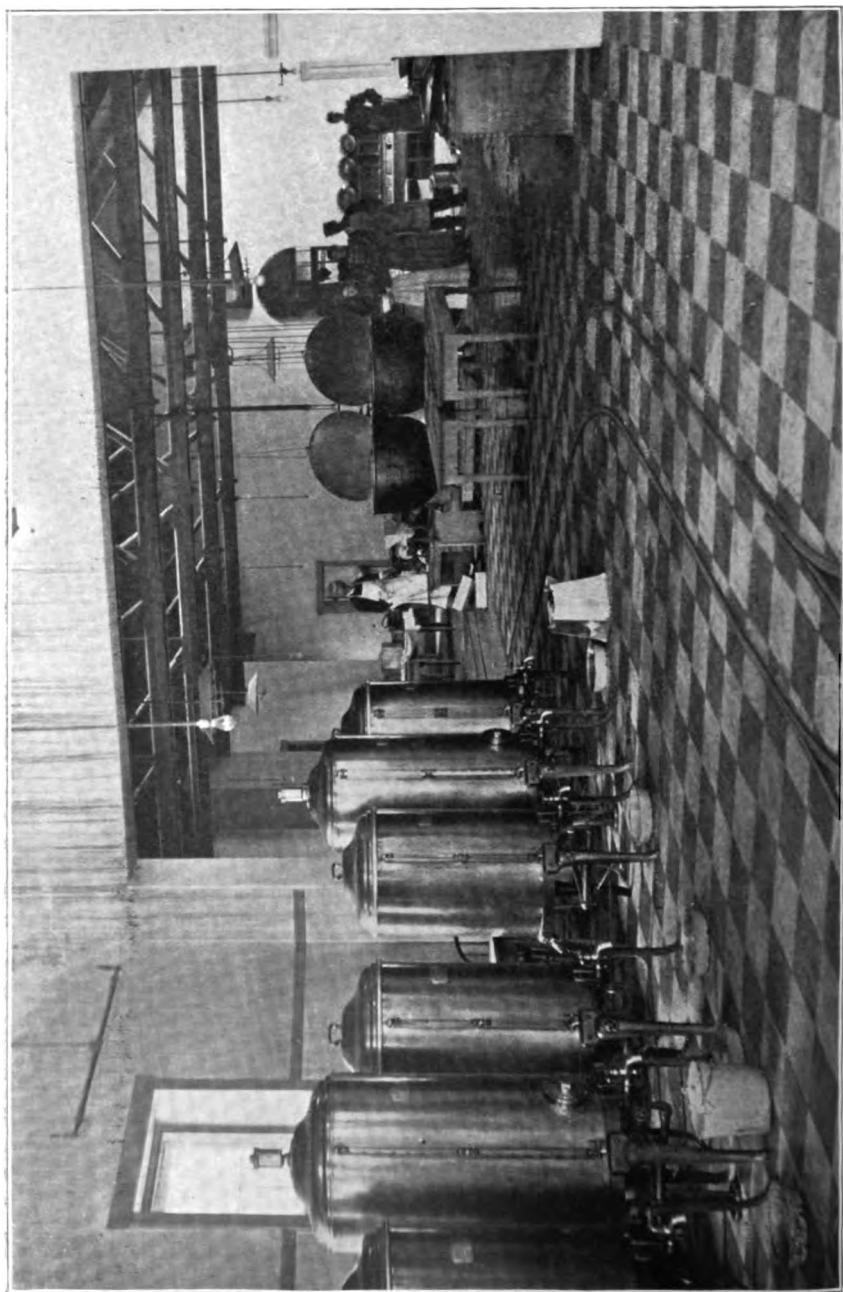
ST. ELIZABETH—ATKINS HALL. INTERIOR OF DAY ROOM, 1878.



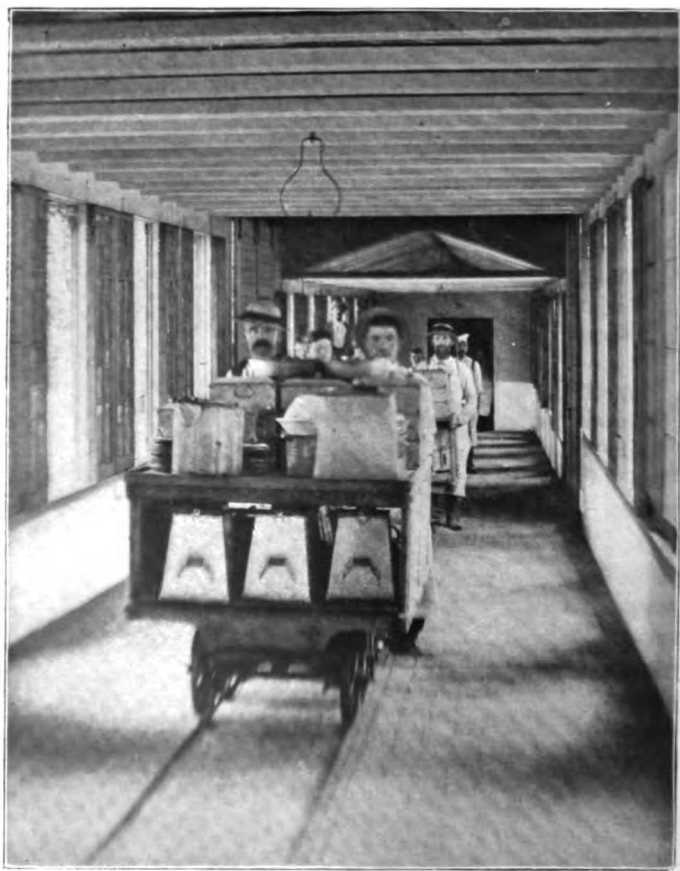
ST. ELIZABETH—DINING HALL FOR DETACHED BUILDINGS, 1885.



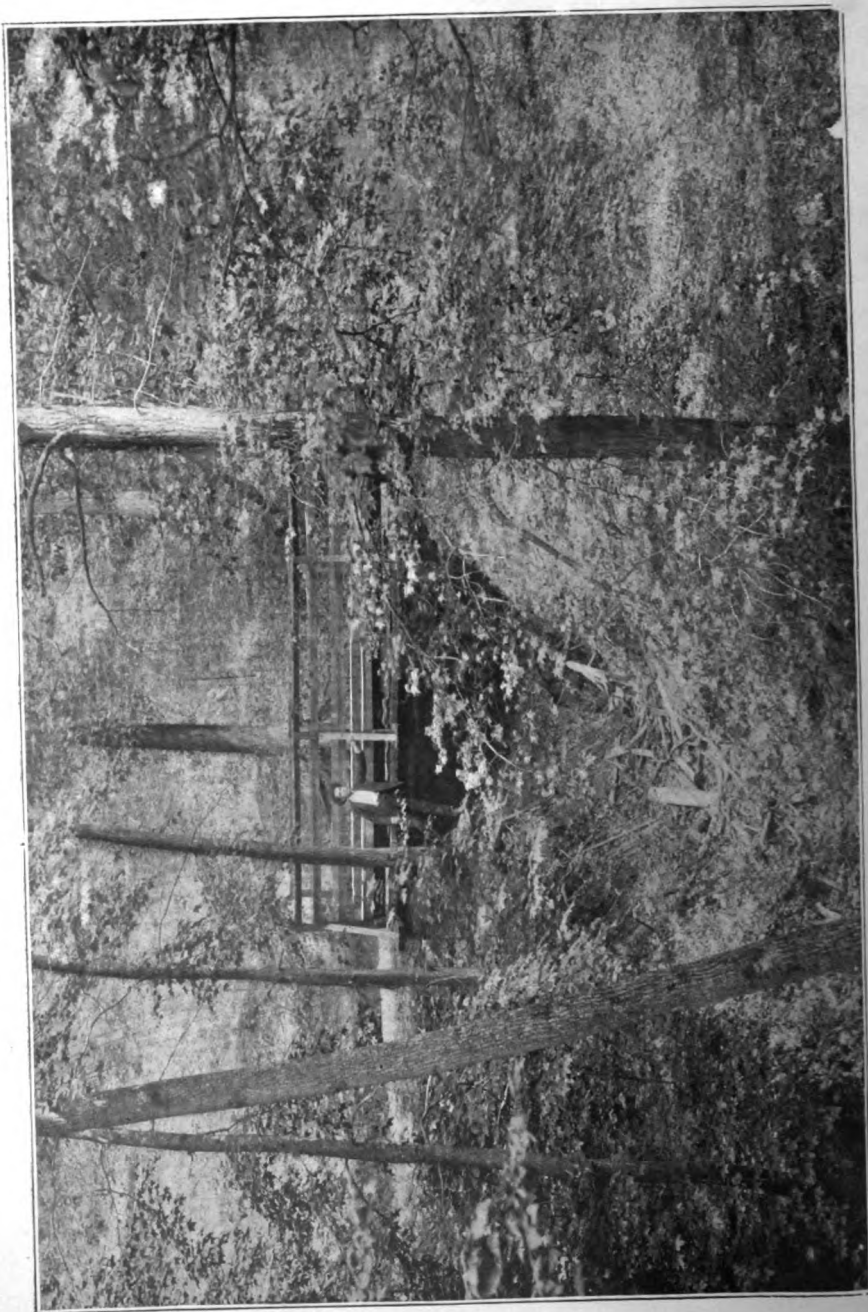
ST. ELIZABETH—INTERIOR OF DINING HALL FOR DETACHED BUILDINGS, 1885.



ST. ELIZABETH GENERAL KITCHEN INTERIOR.



ST. ELIZABETH FOOD CAR.



ST. ELIZABETH—IN THE WOODS.

the decision was afterwards held to apply to those admitted under sections 4844, 4845, and 4846. Mr. Justice James, in delivering the opinion of the court, said:

In our opinion, this whole matter is regulated by the Maryland statute of 1785, chap. 27, section 6, which contemplates that the person whose affairs the chancellor is to have control of shall be found insane by a jury of inquiry. There must be a regular adjudication of the question by due process of law, without which even the chancellor can not act, and due process of law in establishing the insanity of a person has long been declared to be by inquiry through a jury. * * *

We hold, therefore, first that these sections of the Revised Statutes do not contemplate compulsory seclusion in this institution without due process of law. They only open its doors to those who have been properly found to be insane persons. If they meant anything else, they would be unconstitutional.

And secondly, we hold that the whole matter of the care of insane persons is regulated by the act of Maryland of 1785, which includes this proceeding of an inquiry by jury.

Following this judicial decision the mode of procedure has been changed, and residents of the District of Columbia are now brought before a marshal's jury, who find out their mental condition after the antiquated procedure of the Maryland law of 1785, before they are committed to the hospital by the District authorities. Maryland has long since superseded this law by more enlightened modern legislation, but, the District of Columbia, having been set off from the territory of Maryland in the last century, that old enactment of more than a hundred years ago becomes a part of that precious legacy, the common law of the District.

The attention of the joint select committee of Congress to investigate charities and reformatory institutions in the District of Columbia having been called to the abuse under this proceeding, as well as to the accumulation of nonresident insane from the District in the hospital from the want of power or funds on the part of the District authorities to remove them, it resulted in a letter being addressed to the Secretary of the Interior by the chairman of the joint select committee, calling his attention to the fact that the District was being imposed upon, and requesting him to call the attention of the board of visitors to the matter, with the view of suggesting legislation to remedy the abuse.

The following is the reply:

DEPARTMENT OF THE INTERIOR,
Washington, May 17, 1898.

SIR: Referring to your letter of the 24th ultimo regarding the necessity for legislation for the proper commitment of insane persons to the Government Hospital for the Insane, I have the honor to transmit herewith for your consideration a copy of a letter from the president of the board of visitors of the Government Hospital for the Insane, inclosing a draft of a bill "to change the proceedings for admission to the Government Hospital for the Insane in certain cases, and for other purposes."

This bill, in the opinion of the board, furnishes an efficient procedure for admission to the Government Hospital for the Insane, and provides protection for the United States and the District of Columbia from the expenses and charge of insane persons who did not reside in the District at the time they became mentally disqualified.

Very respectfully,

C. N. BLISS, *Secretary.*

Hon. JAMES McMILLAN,
*Chairman Joint Select Committee to Investigate Charities and Reformatory
Institutions in the District of Columbia, United States Senate.*

GOVERNMENT HOSPITAL FOR THE INSANE,
Washington, May 18, 1898.

SIR: In obedience to the request contained in your communication of the 25th of April, ultimo, I have the honor to report that the Board of Visitors of the Government Hospital for the Insane have given much consideration to the subject referred

to in your communication and its inclosure, being a copy of a communication to you from the chairman of the Joint Select Committee to Investigate Charities and Reformatory Institutions in the District of Columbia, and I am instructed by the board to submit for your consideration and that of the joint committee a draft of a bill furnishing, in the opinion of the board, a more efficient procedure for admission to the Government Hospital for the Insane, and a better provision for the protection of the United States and the District of Columbia from the expense and charge of indigent insane persons who did not reside in the District at the time they became insane.

Following the example of most of the States, we have not provided in the accompanying bill for an inquisition by jury, believing that mode of inquiry to be undesirable in the proceedings contemplated in the bill, and we venture to suggest that such inquiries can be more satisfactorily made by a judge, assisted by expert and other testimony.

It is to be noted, furthermore, that the inquisition by jury is not usual in cases where persons are taken by authority of law from their homes and placed in public hospitals to prevent their maladies from becoming epidemic. We do not perceive that an alleged lunatic is entitled any more to the inquisition by jury than an alleged leper.

I have the honor to be, very respectfully,

B. SUNDERLAND,
President of Board of Visitors.

Hon. C. N. BLISS,
Secretary of the Interior.

Bill reported to the United States Senate by Senator Faulkner for the Committee on the District of Columbia, June 1, 1898, and now on the Senate Calendar, No. 1828.

A BILL To change the proceedings for admission to the Government Hospital for the Insane in certain cases, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That hereafter proceedings for admission to the Government Hospital for the Insane or indigent insane persons residing in the District of Columbia, and of independent or pay patients admitted to the said hospital under section forty-eight hundred and fifty-four of the Revised Statutes of the United States, and for admission temporarily to said hospital of nonresident insane persons found in the said District, shall be commenced by petition presented in open court to the justice of the supreme court of the District of Columbia holding a special term for orphans' court business, stating the facts necessary to admission to said hospital as heretofore provided by law.

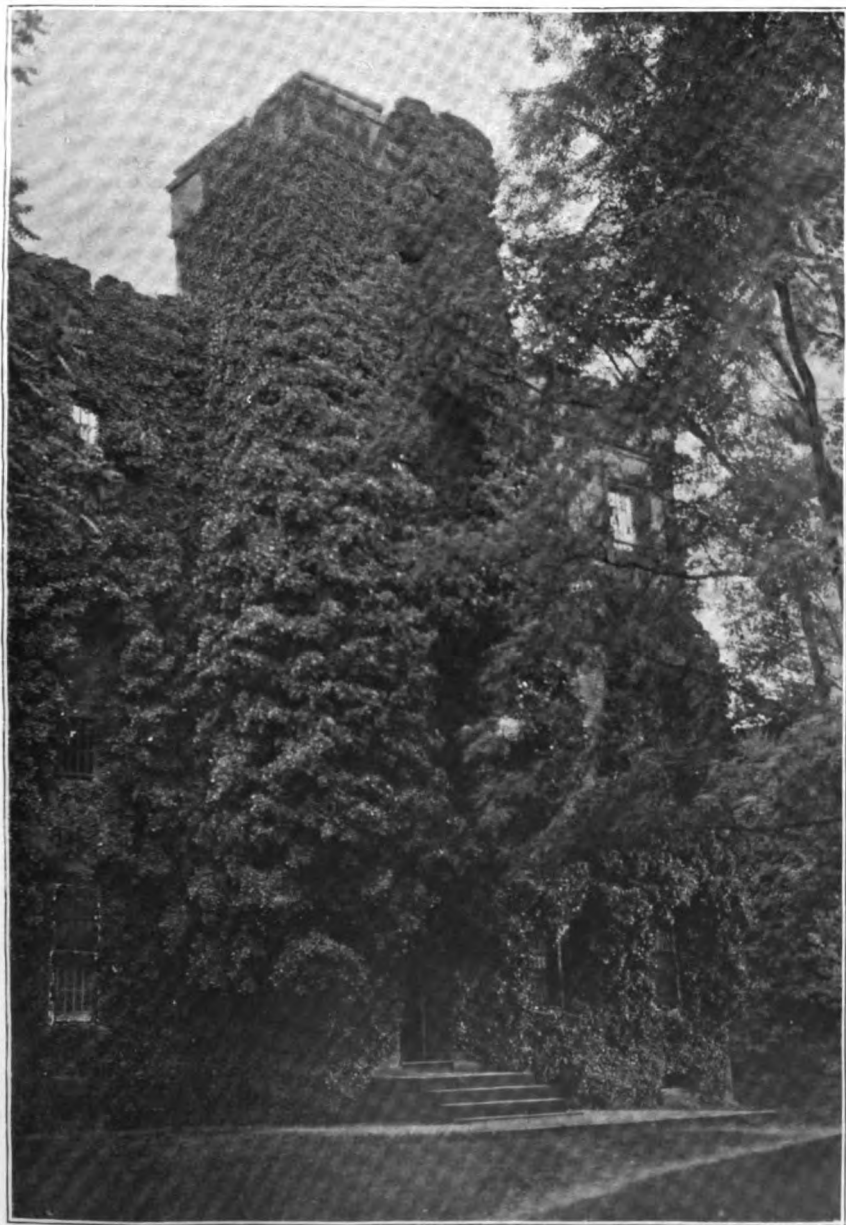
SEC. 2. That such petition shall be signed and sworn to by some responsible resident of the District of Columbia, but shall not be filed until the court shall be satisfied as to the responsibility and residence of the person signing and swearing to the same.

SEC. 3. That the order of the court directing the filing of the petition shall require a copy thereof to be served on the alleged lunatic and another on the Commissioners of the District of Columbia, and shall fix a time for the hearing of the application, and a copy of such order, duly authenticated, shall be inscribed on each of the said copies before service thereof.

SEC. 4. That so soon as may be after the filing of the petition the court shall appoint two or more physicians, not connected with any hospital for the insane, to examine the person alleged in the petition to be insane, and testify as to his mental condition, each of such physicians to be paid a per diem compensation of ten dollars by the District of Columbia, on the certificate of the court that his account for such service is just and correct, and other witnesses examined on such application shall be paid by the District the fees and allowances prescribed by law for witnesses summoned in behalf of the United States; and all other costs of the proceeding shall be paid by the District: *Provided*, That in the case of independent or pay patients the petition shall be signed by one of the nearest relatives of such insane person, by his legal guardian, or by some friend. All costs of the proceeding shall be defrayed out of the estate of such person, and a deposit shall be paid into court sufficient to cover such costs; and the request for admission to said hospital shall be made within five days after the entry of the order of court.

SEC. 5. That the court shall require the presence of the alleged lunatic at the hearing of the application, unless for good reason it shall direct otherwise by an order stating such reason.

SEC. 6. That the order of the court on the hearing of the application on the petition and evidence shall be made without an inquisition by jury, and all the proceedings under the petition shall be entered in the minutes of the court.



THE IVY TOWER, ST. ELIZBAETH SECOND ENTRANCE WEST.

SEC. 7. That it shall be the duty of the Commissioners of the District of Columbia, so soon as practicable, to return to their places of residence or to their friends all indigent insane persons not residing in the District at the time they became insane who are now detained in the Government Hospital for the Insane, or who shall be committed to the said hospital to be temporarily cared for, as provided in section forty-eight hundred and fifty of the Revised Statutes of the United States, and all necessary expenses incurred by the Commissioners in ascertaining the locality where such persons or their friends belong and in returning them to such locality shall be defrayed by the District of Columbia.

SEC. 8. That all provisions of law inconsistent with this act be, and the same are hereby, repealed.

It is very much to be hoped that this much-needed legislation will be placed on the statute books at the coming session of the present Congress, and so end the existing clumsy proceedings for the commitment of the District insane. The clause introduced and passed in the general deficiency bill approved July 7, 1898, intended to remedy, does not help matters very much. The following is the language of the act:

Hereafter in all proceedings by the Commissioners of the District of Columbia to commit resident indigent insane persons to the Government Hospital for the Insane, it shall be the duty of the marshal to empanel juries in such cases from the jurors in attendance upon the criminal courts of said District, who shall perform such service in addition to and as part of their duties in said courts: *Provided*, That during such time as jurors are not in attendance upon said criminal courts, the marshal may in such cases empanel the jurors in attendance upon the police court, who shall perform such duties in addition to and as a part of their duties in said police court.

Aside from the fact that this act makes the expense of these trials a part of an appropriation for the courts rather than a separate item, and elevates somewhat the Falstaffian recruit character of a marshal's jury as usually summoned from the purlieus of the court-house, it really accomplishes nothing. Instead of a careful determination of the mental condition of the person by a judge on the bench, we have the opinion of thirteen men, not on the facts of a crime, but the conditions of a disease of which they have probably had no personal experience. But assuming that this is a satisfactory and enlightened way of determining the sanity of a man and is moss-grown and hoary with precedent, this law stops with the "resident indigent insane of the District," and the large number of nonresident insane remain unprovided for, to be sent to the hospital with the semblance of law under the old sections of the Revised Statutes, to remain until the speculative philanthropy of some lawyer compels the superintendent to produce the insane man in court, there to be told by his honor that the papers of commitment are "entirely irregular; the case is dismissed," and the lunatic goes forth to prey upon the community on which some neighboring State has foisted him. What is wanted is legislation to put an end to all this, to properly protect the rights of the lunatic in his detention, to empower the hospital to detain him, and to require the authorities of the District of Columbia to ascertain, in the case of a nonresident, where he belongs, and, having ascertained this, to send him thither under proper escort, a sufficient appropriation for such purpose having been provided in the District bill. Then will the District of Columbia no longer be made a dumping ground for lunatics, this community will have a rest from the wild-eyed man with a mission, and the pettifogger with his trilobite act of 1785 will cease from troubling.

In the sundry civil bill approved July 1, 1898, Congress provided for the legal custody of funds belonging to inmates of the Government Hospital for the Insane and coming into the hands of the hospital authorities, by authorizing the superintendent to deposit the same in the United States Treasury in his name as agent, drawing from the same

by check from time to time as needed, under regulations prescribed by the Secretary of the Interior, and giving a separate bond for his faithful performance of the duty thus devolved upon him. The following is a copy of the regulations as approved by the Secretary:

Rules governing the superintendent of the Government Hospital for the Insane in the withdrawal of funds from the United States Treasury, deposited by the superintendent, as agent, belonging to inmates of the hospital, the same being under act approved July 1, 1898.

1. The superintendent shall give a separate bond, as agent, in the sum of \$5,000, with sureties satisfactory to the Secretary of the Interior, for the faithful custody and disbursement of all funds received by him as agent.

2. He shall keep, in books subject at all times to the inspection of the proper officials, a separate account with each patient having money on deposit, showing amount received, expended, and the balance of each.

3. He shall deposit in the United States Treasury in his name, as agent, not later than at the end of each month, all funds now in his hands or which may hereafter be intrusted to him by or for the use of patients, which shall be kept as a separate account.

4. He is authorized to draw therefrom on his order, from time to time for the use of such patients, not to exceed for any one patient the amount intrusted to the superintendent on account of such patient.

5. He shall, on or before the 15th of each month, render a certified statement (in duplicate) to the Secretary of the Interior, showing the state of this fund at the close of the preceding month, together with a detailed statement giving the individual amounts received and expended on account of each patient; the duplicate statement to be forwarded to the Auditor of the Treasury for the Interior Department for verification and file in his office.

6. He may, subject to the limitations of the law, draw, as such agent, within the penalty of his bond, such sums as in his judgment may be necessary for the use of individual patients, either by check for minor payments, or a check stating on the margin on whose individual account it is drawn, either as a final payment or as a major advance on his account on deposit.

There appears to be a want of exact knowledge in the public mind of what St. Elizabeth, or the Government Hospital for the Insane consists, some Members of Congress even regarding it as a large building for the insane of the District of Columbia, situated on the heights south of the Capitol, beyond the Anacostia River. It is really a village of the insane who are wards of the nation. The report for 1895 contained plats of the ground, showing the arrangements of the buildings then erected, with some brief account of their different uses. The demand for this report has been so great that the edition has long since been exhausted, so that it is now impossible to supply it, and, as owing to the prolonged illness of Dr. Blackburn it has been thought best to omit a pathological report this year, it has been decided to reproduce the plats of the buildings and grounds, and by way of explanation to say concisely some things that have been said in the former reports respecting the hospital buildings and purpose.

The Joint Select Committee of Congress to Investigate the Charities and Reformatory Institutions in the District of Columbia having quite copiously illustrated their report with views of our buildings, it becomes possible, without additional expense to the Government, to present in this report, along with the ground plans, views of some of the principal buildings, which may serve to elucidate the text regarding them.

St. Elizabeth, the home farm, is a tract of upward of 400 acres, from which the hospital takes the name by which it is popularly known. On this tract are most of the hospital buildings. Something like a mile south, lying on the main road, is the Stevens Farm, of about 60 acres, named for the Hon. Thaddeus Stevens, who secured it for the hospital. The latter is good soil for the most part, and is devoted entirely to agri-



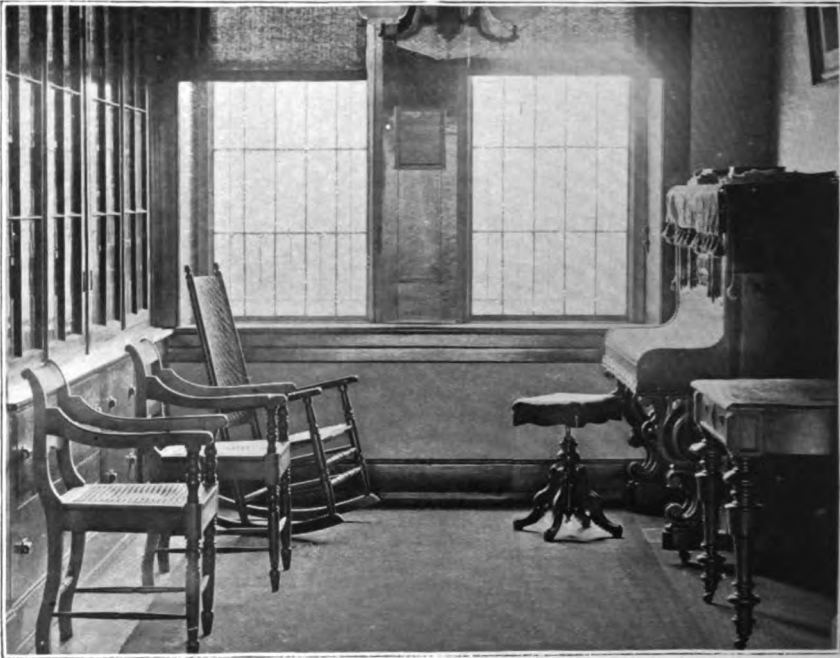
ST. ELIZABETH—BARNs AND PIGGERY.



ST. ELIZABETH—HERD OF HOLSTEINS.



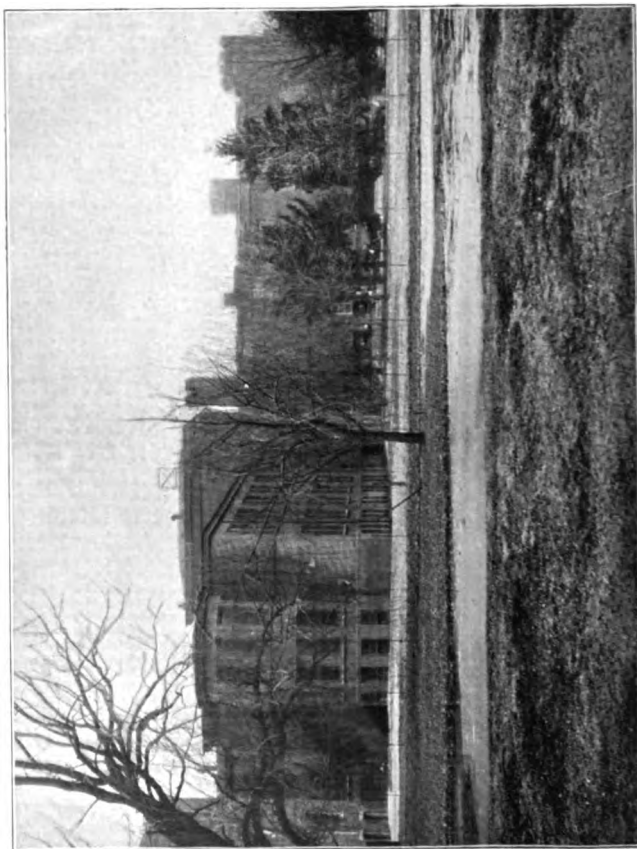
ST. ELIZABETH--GODDARD CROFT, MANOR HOUSE.



MALE WARD—ALCOVE.



MALE WARD—CORRIDOR.



ST. ELIZABETH—RETREAT WING OF MAIN HOSPITAL, 1884.

cultural purposes. Five miles away, going south, lying on the Potomac's eastern shore, directly opposite Alexandria, is Godding Croft, a farm of nearly 350 acres, where a small colony of the working male patients has been established, and where, with the bringing in of abundant water supply during the present year it is proposed to increase the number of colonists to 100 working men. This departure bids fair in the future to become a leading feature of the hospital, while to its present inmates Godding Croft already affords a pleasant home. There is a view shown of the manor house and a plat of the farm at Godding Croft.

Returning now to St. Elizabeth, in addition to the plat of the grounds showing position of the buildings is a reduced reproduction of the architect's elevation of the main hospital edifice as planned by Dr. Charles H. Nichols, the first superintendent, and executed by Thomas U. Walter, architect. The plan was a liberal one, a grand conception, much in advance of most of the hospital structures of its time. The building, of plain, unpressed brick, but thoroughly built, was commenced in 1853, and a portion occupied as early as January, 1855. The whole exterior of the building as shown in the elevation was completed in 1860. Extensions have since been made to both wings. The views illustrating this are St. Elizabeth, main entrance, Ivy Tower, and St. Elizabeth Retreat wing. The administration portion of this building divides the male from the female wards. Here all patients are received, and as a rule kept a short time for observation. There is a physician in charge of each department, and a night medical officer is on duty for any emergency.

The central male group comprises the west wing of the main hospital, with its Dawes and Garfield extensions, and the West Lodge a distinct building for colored male patients. The extensive additions now being made to the Lodge will give an infirmary provision that was much needed for this class, and will carry up the accommodations in this central male group to 500 inmates. These are the wards from which transfers to other male groups are constantly being made. The view of the West Lodge was taken before the present extension was commenced.

The east wing of the main building, with its retreat extension, is for the female patients, and, together with the East Lodge for colored females, Dix buildings Nos. 1 and 2 for white female epileptics, and Dix 3 for colored female epileptic insane, these constitute the female department. This group has distinct grounds, with groves and lawns. There is an infirmary ward in the main building, with suitable appliances for the sick and infirm, with a day and night service of special nurses. The excited wards of the retreat have also continuous service of attendants. The Dix buildings are wards with bedsteads and furniture specially fitted to the needs of this unfortunate class. They also have day and night service, with open wards, broad piazzas, and pleasant grounds, tempting to an outdoor life in all pleasant weather. The female group is crowded, having to provide for over 400 inmates. As the Dix Nos. 1 and 2 are specially planned for care of the epileptic white females, ground plans are presented. Views are given of the Retreat addition, with east wing; also of the Dix Nos. 1 and 2, East Lodge. Connected with this female group, though a distinct building, is the Borrows cottage, which was built with funds given by Mrs. C. Z. Borrows to provide that there might be, in the language of the law, "vacancies" for private or pay patients at St. Elizabeth, and that her afflicted daughter

might always have a home there. The pleasant cottage and its surroundings are an ornament to the grounds and a fitting memorial to its donor. A view of the building is given herewith. It is the only existing provision for pay patients at the hospital.

The third, or west, group is for homicidal and criminal male patients. This is a distinct provision, with separate grounds. Howard Hall, as the building is called, is built in four wings that completely inclose a paved court, where in pleasant weather the inmates can with entire safety be in the open air. There are eight wards, with 120 single rooms and one associate dormitory for dangerous epileptics, it being a provision for 132 in all. The building, which is under the charge of a physician, has extensive arrangements for labor, which is a prominent feature in the care of this class; also dining rooms, a large smoking hall, and an amusement room. There are also distinct grounds where a part of these men are employed on the land. The separate provision for the dangerous class gives greater freedom to the rest.

A view of Howard Hall will be found herewith.

The fourth, or eastern, group is for male patients for the most part of a chronic and quiet type. Here dwell a majority of those veterans from the National Home for Disabled Volunteer Soldiers, who are each year advancing toward age and infirmity. The group consists of eight buildings, with a physician who resides on the grounds and keeps the oversight of 600 patients. Here are several acres in distinct grounds, where in pleasant weather most of those not elsewhere employed, or too infirm to leave the buildings, live in the open air. They have a large dining hall, workroom, bowling alley, and billiard table, and fireproof smoking apartment. The buildings occupied are known as Atkins Hall, which is a working men's abode; the Relief, the Home, the Dining Hall, and Allison buildings, viz, A, B, C, and D. These are all shown in the illustrations. The Allison buildings are a subgroup just completed and fitted up for the infirm and bedridden veterans. They are intended to make what remains of life as comfortable as possible, and both indoors and outdoors they invite the tired pilgrim to rest here from his wanderings. They represent the high-water mark of comfortable provision thus far at St. Elizabeth.

The fifth, or southern group, is a third of a mile away from the main building, but connected, as are most of the buildings at St. Elizabeth, by subterranean gallery with the other groups. This, like the last, has a resident physician, and is for the class requiring active treatment, also for male epileptics. The group consists of a distinct kitchen building, specially designed, for this group, the Toner building, and the Oaks Nos. 1 and 2. Views of these, with ground plan of the same, accompany this report. The Oaks are constructed with special reference to the care of the epileptic class, with large dormitory for the majority, and single rooms with latticed doors for the observation of those requiring such provision. Sharp angles and projections have been avoided in finishing, and the furnishing has been with cane furniture, having in view the protection from injury in falls. The dormitories are above, the day rooms below; the latter opening on broad piazzas invitingly free. Life passes as pleasantly here as in any part of this extensive community of mental invalids. Ground plans of these epileptic wards are submitted herewith. The provision of this group is ample for 200 inmates, nearly one-half of whom are epileptics.

The remainder are cases of active disease, or, if chronic, the attempt is made to select those that it is hoped may be benefited by active

with unconfined floor space. By working all night the attendants have the tables back in order for the morning meal. It is worth all it costs; these two evenings are to the patients more than the amusements of all the rest of the year. And to think, with a suitable building they might have this once a week through all the long winter evenings, content in their seclusion; enjoying their lives; forgotten by the world, and happy in being forgot. Then for their Sunday rest how fitting their beautiful chapel, with its organ swells, its familiar hymns, its confession of faith, and the Angelus uplifting and sustaining their heavy laden lives. Is it nothing to you, "all ye that pass by," that the consolations of religion should be theirs, that they might be healed? It is a little thing to give, "a cup of cold water only," that shall not fail of its reward.

The sum of \$4,500 is asked for the erection of a slaughterhouse, mule stables, and cart sheds adjoining the stock barn. When the swine were kept in the vicinity of the stables back of the main hospital their slaughtering was necessarily in close proximity to the wards. The piggery, being objectionable, was removed to the outfarm a number of years ago, and, now that the old pens and outhouses have been taken away to prepare a site for the new laundry building, provision should be made for the slaughterhouse as well as the mule stables and sheds for farm carts on the outfarm where they properly belong.

The time has come when the boiler for hot-water supply, which was originally a boiler in the heating apparatus of the main building, must be renewed, and as the use of this boiler in its old position involved the objectionable feature of a fire and consequent heat even in summer directly under one of the male wards, it has been decided, now that a change has to be made, to place the heaters in the boiler house, and since the present boiler is entirely inadequate as a central supply, in constructing a new plant to make it adequate for this most important need.

In the extensions recently made to the relief and two wings of the main hospital building nonabsorbent tile floors and the most approved style of modern plumbing has taken the place of the old objectionable arrangement of bath and toilet rooms. As a sanitary measure it is absolutely necessary that this should be carried through the buildings, and the sum of \$5,000 is asked for the continuance of the work in the main hospital where the need is most urgent.

With the constant enlargement of the hospital accommodations it becomes necessary to extend the brick pavements about them, and the sum of \$2,500 is needed for that purpose. It is essential to the proper policing and general tidy appearance of the whole.

Three sections are carried to a height that renders some more practical fire escape for lunatics than the ordinary iron ladder necessary. The appropriation asked contemplates the erection of three Kirker Bender fire escapes with stand pipe, unless, in the opinion of experts, some still better and more efficient one can be found.

Atkins Hall, erected in 1879 as a temporary building for workingmen, has now reached a time when its floors must be renewed, and as the building has served an admirable purpose for the workingmen, and, with some necessary changes from lath partitions and the addition of broad piazzas where the men can sit when their work is done, it will be a model structure of its kind, we ask an appropriation of \$5,000 to make the necessary changes.

The extension of the West Lodge for colored male patients, for which an appropriation was made at the last session of Congress, is being

pushed to completion and will be ready for occupation in the coming spring. It is asked that the appropriation of \$1,500 for beds and necessary furniture be made immediately available in order that the overcrowding of this class may be relieved at the earliest moment.

The war, with its increase of the Army and Navy, has brought an unexpected accession of numbers likely to be permanent, and creates a necessity for immediate additional accommodations to avert the evils of excessive overcrowding that are else inevitable. Following the guidance of past experience, it seems most desirable that such further provision should be of a kind to afford the greatest relief and at the same time make the hospital accommodations the most complete in all respects. Cottage homes for the laboring classes is the direction recommended for this expenditure. Plain, substantial buildings, every way creditable, with home comforts and appliances rather than architectural effect, can be constructed for a very reasonable sum. It is estimated that suitable homes for 100 of the male and 25 of the female workers among the inmates can be built for \$31,250, and that sum is accordingly asked.

The absence of any pathological report will be noticed. The protracted illness of Dr. I. W. Blackburn, now happily convalescing, has precluded the possibility of that continued labor necessary to the preparation of an elaborate report of the year's results in this direction, and it was thought best to omit it altogether. Meantime the pathological building has been enlarged, affording more complete arrangements for prosecuting scientific research, including urinary analysis and bacteriological studies. The photographic rooms are now ample for the work, and a photograph of each patient is made a part of the record of his case. In the absence of Dr. Blackburn, Dr. Thomas Dowling, jr., medical interne, is rendering valuable assistance in the pathological department.

The medical supplement presents an interesting résumé of the professional work in certain lines of treatment. The very complete hydrotherapeutic apparatus is giving great satisfaction and affording some results that are very gratifying. Dr. George H. Schwinn, as medical interne, is doing good work under the direction of Dr. Foster. In the line of the "most enlightened curative treatment" of those intrusted to our care we have availed ourselves of the best counsel at our command, outside of the resident medical staff, in medical, gynecological, and surgical directions, and the valuable aid of Drs. James W. H. Lovejoy, W. W. Johnston, J. W. Bayne, James Kerr, S. M. Burnett, William V. Marmion, I. S. Stone, and Henry D. Fry is gratefully acknowledged.

In the direction of donations we gladly acknowledge the continued contribution for the inmates of illustrated papers from the Sunday School Union at Philadelphia, Pa., the gift of a barrel of carefully selected reading matter from the Paper Mission of North Cambridge, Mass., also illustrated magazines from Mrs. Detweiler and others, of Washington. Friends have not been wanting to aid in our evening entertainments with concerts, plays, and exhibitions of the latest photographic illustrations of nature and art with the oxyhydrogen light. Mr. Copeland still claims the decorations for our Easter Monday ballroom for his art, and lays us under renewed obligation with each year. To all who have in any way assisted us in the good work of affording pleasure to these shadowed lives our thanks are given.

Beyond the temporary appointment of the two medical internes already mentioned, there has been no change in the medical staff.



ST. ELIZABETH—IN THE RAVINES.

Each in his place has continued to discharge the important trust devolved upon him. There have been some changes among the subordinate officers, but in the main the work, which is endless and always growing, has gone quietly and steadily on to the fulfillment of its high mission—the humane care of these dependent ones. So, silently the year's record passes into history, and we enter upon another year of toil and endeavor, confident that the work is such as to commend itself to the liberal provision of Congress, that has never been unmindful of our needs.

We are, sir, very respectfully,

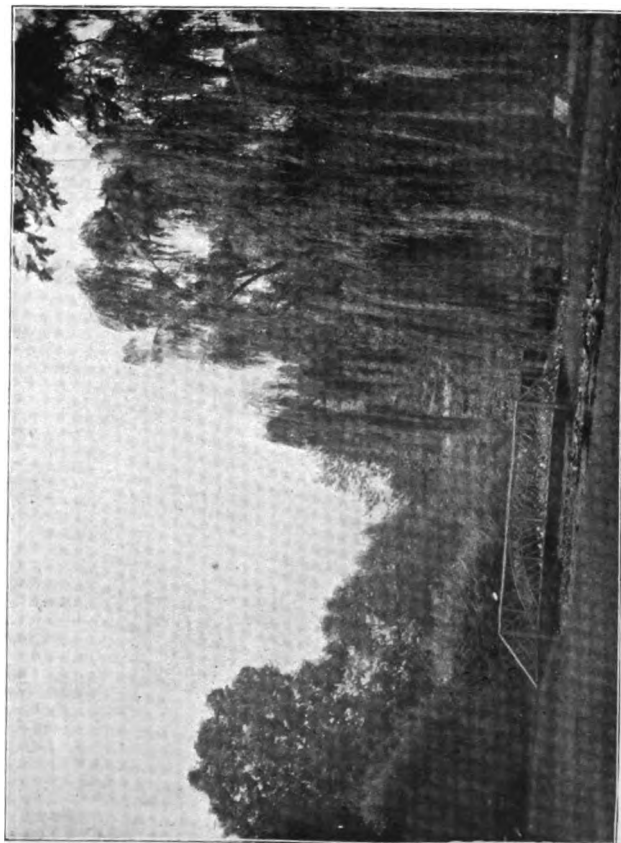
B. SUNDERLAND,
President.

W. W. GODDING,
Secretary, ex officio.

Hon. C. N. BLISS,
Secretary of the Interior.



ST. ELIZABETH—IN THE RESERVATION.



ST. ELIZABETH—THE RUSTIC BRIDGE.

REPORT OF THE SUPERINTENDENT.

GOVERNMENT HOSPITAL FOR THE INSANE,
Washington, D. C., September 20, 1898.

SIR: In accordance with the act of Congress approved June 4, 1880, requiring the superintendent of the Government Hospital for the Insane to make a report to Congress annually of the detailed expenditures of the hospital for the preceding fiscal year, I have the honor to submit the following statement.

I am, sir, very respectfully, your obedient servant,

W. W. GODDING,
Superintendent.

Hon. CORNELIUS N. BLISS,
Secretary of the Interior.

*Classified expenditures, Government Hospital for the Insane, for the fiscal year ending
June 30, 1897, additional.*

SUBSISTENCE.

Date.	Furnished by—	On voucher numbered.	Tea and cof- fee.	Fish and poultry.	Salt meat.	Fresh meat.	Fruit and vegetables.	Other groce- ries.	Flour, meal, crackers, etc.	Grand total.
1897.										
June 30	G. G. Cornwell & Son.	721	\$132.99	.....	.....	.....	.....	\$33.71	.....	.....
30	R. A. Golden.....	739	.....	\$88.00	.....	.....	.....	.....	.....	.....
30	Thos. O. Varnell.....	740	.....	.....	.....	\$229.13	.....	.....	.....	.....
30	W. F. Nash.....	746	.....	.....	\$53.02	.....	.....	.....	.....	.....
30	E. J. Adams & Co.....	747	.....	.....	.....	.....	\$372.46	.....	.....	.....
30	B. B. Earnshaw & Bro.	749	.....	.....	.....	.....	.....	142.04	.....	.....
30	F. S. Wertz & Co.....	772	.....	.....	.....	.....	.....	.....	\$543.60	.....
	Total.....	.....	132.99	88.00	53.02	229.13	372.46	176.75	543.60	\$1,594.95

HOUSE FURNISHING, ETC.

Date.	Furnished by—	On voucher numbered.	Furniture, fixtures, etc.	Crockery, etc.	Bedding.	Table and towel linen.	Kitchen fittings.	Grand total.
1897.								
June 30	Joe. D. Wilson.....	712	\$52.05	.....	\$284.19	\$45.23	.....	.....
30	Louis A. Dieter.....	713	47.80	.....	.....	.....	.....	.....
30	Frank Libbey & Co.	714	27.56	.....	.....	.....	.....	.....
30	The Manhattan Sup- ply Co.....	715	.....	\$75.95	.....	.....	.....	.....
30	Lansburgh & Bro.....	717	5.30	.....	56.22	169.34	.....	.....
30	Welsbach light.....	718	1.50	.....	.....	.....	.....	.....
30	M. G. Copeland & Co.	730	167.00	.....	.....	.....	.....	.....
30	Church & Stephenson	722	33.02	.....	.....	.....	.....	.....
30	J. M. Peake, agent.....	728	9.36	.....	.....	.....	.....	.....
30	E. N. Gray & Co.....	730	.....	.....	.....	.....	57.80	.....
30	Wilmarth & Edmon- ston.....	732	.....	102.66	.....	.....	.....	.....

Classified expenditures, Government Hospital for the Insane, etc.—Continued.

HOUSE FURNISHING, ETC.—Continued.

Date.	Furnished by—	On voucher numbered.	Furniture, fixtures, etc.	Crockery, etc.	Bedding.	Table and towel linen.	Kitchen fittings.	Grand total.
1897.								
June 30	W. B. Moses & Sons	735	593.58					
30	F. P. May & Co	748		119.23				
30	E. Imhauser	756	7.20					
30	J. P. Nawrath	757	8.99					
30	A. Lisner	763		211.91				
30	The Mineralised Rubber Co.	769			78.08			
30	W. H. Butler	771	42.30					
30	Estate of M. W. Beveridge	774		964.78				
30	A. W. Ward & Son	781					15.75	
	Total		996.06	1,494.52	418.49	214.57	73.55	\$3,196.79

DRY GOODS AND CLOTHING, ETC.

Date.	Furnished by—	On voucher numbered—	Shoes, etc.	Hats.	Notions.	Stationery.	New clothing.	Clothing material.	Freight and drayage.	Grand total.
1897.										
June 30	Lansburgh & Bro.	717			\$32.39			\$197.22		
30	W. Stokes Kirk	734					\$45.00			
30	Joe. D. Wilson	725						.75		
30	John Wanamaker	744						264.39		
30	Joe. Auerbach	750		\$68.75						
30	Wyckoff, Seamans & Benedict	751				\$4.00				
30	Robert Cohen & Son	762	\$1.25							
30	Augustus Thomas & Co	754						97.45		
30	Fred. A. Schmidt	755				6.48				
30	Dixon, Bartlett & Co.	758	6.60			2.80				
30	N. Bunch	759								
30	Smith, Kline & French Co.	761			6.00					
30	E. Morrison Paper Co	764				289.05				
30	B. Rich & Sons	765		\$3.01	23.90					
30	The Geo. W. Knox Express Co	766							14.00	
30	Adams Express Co	768							19.30	
30	Saks & Co.	777		\$9.00			15.00			
	Total		7.85	140.76	61.29	302.33	60.00	559.81	27.80	\$1,159.34

DRUGS, MEDICINES, ETC.

Date.	Furnished by—	On voucher numbered—	Drugs, medicines, etc.	Amusement of patients.	Dental supplies.	Alcoholic stimulants.	Instruments, etc.	Rebate of board.	Grand total.
1897.									
June 30	G. G. Cornwell & Son	721				\$144.36			
30	Z. D. Gilman	723	\$288.73				\$23.46		
30	Scheller & Stevens	726	169.30						
30	E. J. Lewis	731			\$5.25				
30	Mackall Bros. & Flemer	742	302.73						
30	F. A. Tschiffely	748	447.31						
30	Daniel Loughran	745		\$107.50					
30	Humphreys Homeopathic Med. Co.	762	34.20						
30	P. H. Christman	773						\$27.86	
	Total		1,242.27	107.50	5.25	144.36	23.46	27.86	\$1,560.70

Classified expenditures, Government Hospital for the Insane, etc.—Continued.

FARM, GARDEN, AND STABLE.

Date.	Furnished by—	Voucher No.	Fertilizers.	Repairs to vehicles.	Live stock.	Hay and straw.	Plants and seeds.	Implementa, horseshoes, etc.	Harness and repairs.	Grand total.
1897.										
June 30	Adams Express Co..	727	\$16.67							
30	Andrew J. Joyce's Sons	729		\$32.75						
30	Edward S. Schmid ..	734			\$5.00					
30	H. P. Pillsbury	737				\$55.32				
30	W. I. Brooke & Co. .	738					\$17.25	\$48.50		
30	F. P. May & Co.	748						191.70		
30	Kennedy Sons & McGulre	753						16.83		
30	The Mineralized Rubber Co.	769						48.00		
30	W. H. Butler	771							\$8.25	
30	Peter Henderson & Co.	776					85.63			
30	J. B. Kendall	779		164.96						
	Total		14.67	197.71	5.00	55.32	102.88	305.03	8.25	\$690.86

REPAIRS AND IMPROVEMENTS.

Date.	Furnished by—	Voucher No.	Engineers and plumbers supplies.	Electrical supplies.	Hardware, etc.	Masons' supplies.	Paints, oils, etc.	Lumber, doors, etc.	Sundry small repairs.	Grand total.
1897.										
June 30	Jas. B. Clow & Sons..	716	\$30.00							
30	Robert Boyd	719			\$3.50					
30	E. J. Brooks & Co. .	733			12.44					
30	W. M. Whyte & Bro.	30			32.00					
30	S. M. Frazier	31				\$29.00				
30	J. W. Tolson	32						\$1.80		
30	Geo. F. Muth & Co. .	736					\$55.80			
30	M. DuPerow	741		\$216.80			53.55			
30	F. W. Devoe & C. T. Raynolds	760					104.96			
30	Smith, Kline & French Co.	761					35.85			
30	Francis Miller	767					7.50			
30	Standard Oil Co.	770					60.24			
30	W. H. Butler	771					44.43			
30	J. H. Cheesley & Co. .	775			434.28					
30	J. T. Walker Sons ..	778							2.80	
30	Frederick Rose	780					80			
30	W. L. King	782			38.25					
	Total		30.00	216.80	520.47	29.00	363.12	1.80	2.80	\$1,163.99

*Detailed statement of receipts and expenditures of the Government Hospital for the Insane
for the fiscal year ending June 30, 1897, additional.*

RECEIPTS.

On hand:	
Support	\$4, 916.04
Repairs and improvements	64.18
Miscellaneous receipts	4, 385.95
	<hr/>
	9, 366.17
	<hr/>

EXPENDITURES.

Subsistence:		
Tea and coffee	\$132.99	
Fish and poultry	88.00	
Salt meat	53.02	
Fresh meat	229.13	
Fruit and vegetables	372.46	
Other groceries	175.75	
Flour, meal, crackers, etc	543.60	
	<hr/>	1, 594.95
House furnishings, etc.:		
Furniture, fixtures, etc	995.66	
Crockery, etc	1, 494.52	
Bedding	418.49	
Table and towel linen	214.57	
Kitchen fittings	73.55	
	<hr/>	3, 196.79
Dry goods and clothing, etc.:		
Shoes, etc	7.85	
Hats	140.76	
Notions	61.29	
Stationery	302.33	
New clothing	60.00	
Clothing material	559.81	
Freight and drayage	27.30	
	<hr/>	1, 159.34
Drugs, medicines, etc.:		
Drugs and medicines	1, 242.27	
Amusement of patients	107.50	
Dental supplies	5.25	
Alcoholic stimulants	144.36	
Instruments, etc	23.46	
Rebate of board	27.86	
	<hr/>	1, 550.70
Farm, garden, and stable:		
Fertilizers	16.67	
Repairs to vehicles	197.71	
Live stock	5.00	
Hay and straw	55.32	
Plants and seeds	102.88	
Implements, horseshoes, etc	305.03	
Harness and repairs	8.25	
	<hr/>	690.86
Repairs and improvements:		
Engineers' and plumbers' supplies	30.00	
Electrical supplies	216.80	
Hardware, etc	520.47	
Masons' supplies	29.00	
Paints, oils, etc	363.12	
Lumber, doors, etc	1.80	
Sundry small repairs	2.80	
	<hr/>	1, 163.99
On hand, support		8.16
Covered into United States Treasury on repairs and improvements		1.38
		<hr/>
		9, 366.17

Itemized receipts.

1897.	Cash received for—	
June 30.	Board of Earl S. Stone	\$65.00
	Board of Richard E. Williams	86.43
	Board of Edward Lake	65.00
	Board of John M. B. Clitz	520.00
	Board of Jos. D. Marshall	44.00
	Board of Chu-e-rah-rah-he-kah	91.00
	Board of Frank White	91.00
	Board of William Gammell	91.00
	Board of Bobtail Bear	91.00
	Board of Frank P. Davis	65.00
	Board of V. W. Weaver	65.00
	Board of A. W. Weaver	65.00
	Board of Lillian V. Harris	122.14
	Board of Dennis Sullivan	180.00
	Special attendance Cora Gangewer	12.26
	Board of Maria Egli	195.00
	Board of Mary L. Goucher	45.00
	Board of William C. Strong	91.00
	Board of Julia Daniel	65.00
	Board of F. White	91.00
	Board of Chu-e-rah-rah-he-kah	91.00
	Board of Bobtail Bear	91.00
	Board of William Gammell	91.00
	Board of Frank Ralowski	195.00
	Board of Erastus C. Lewis	333.60
	Board of George Cunningham	72.00
	Board of James H. Orr	90.00
	Board of Alexander Van Loan	823.57
	Board of Susan Linkins	45.00
	Sale of stock, etc	412.45
	Disallowance .....	.50
		<hr/>
		4,385.95

Classified expenditures, Government Hospital for the Insane, for the fiscal year ending June 30, 1898.

SUBSISTENCE.

Date.	Furnished by—	Voucher No.	Flour, meal, crackers, etc.	Ice.	Butter, cheese, and eggs.	Fresh meat.	Salt and smoked meats.	Fish and poultry.	Tea and coffee.	Sugar, molasses, etc.	Lard.	Fruits and vegetables.	Other groceries.	Grand total.
1897.														
July 30	Jas. F. Oyster	9			\$1,658.22							\$39.50		
30	Sarah Brown	10										86.00		
31	Ree Howard	11										110.45		
31	John D. Broadus	12												
31	Purity Ice Co.	13	\$746.02											
31	Frank Hume	14					\$182.14		\$646.64		\$73.98		\$77.20	
31	John B. Daish	15	\$986.25											
31	Hyman Powdermaker	16				\$2,017.35	274.10		273.00					
Aug 18	Wm. G. Lowm	43							21.63					
20	J. S. Redmon & Son	49												
28	G. G. Cornwell & Son	50												
31	Sarah Brown	51											8.00	
31	Frank Hume	58												
31	John B. Daish	59					179.40		264.68		72.12		55.13	
31	The G. H. Hammond Co.	60	995.25				470.23							
31	The Purity Ice Co.	62		722.31										
31	Jas. F. Oyster	64			1,715.25									
31	Hyman Powdermaker	65				1,920.06	307.77							
Sept 11	John D. Broadus	85										6.00		
25	Sarah Brown	98										65.25		
27	Austin, Nichols & Co.	101								2,446.22			277.71	
30	Bland Bros. & Wright	106											782.08	
30	The Purity Ice Co.	112		561.87										
30	Hyman Powdermaker	115				2,109.77	219.59							
30	Mary P. Godding	116												
30	M. Pleasant	143										141.61		
Oct 23	Armour & Co.	144				564.16						92.00		
27	W. M. Galt & Co.	154	69.39											
30	Jordan Stabler	156							832.25				165.76	
30	The Purity Ice Co.	158		398.81										
30	John B. Daish	159	1,590.50										4.15	
30	Somersett R. Waters	162	319.18										668.28	
30	W. M. Galt & Co.	163	41.50						381.84	276.61				
30	Jas. F. Oyster	164			8,666.16									
Nov 12	Wm. G. Lowm	197							398.68					
19	Rosenstein Brothers	209												
23	Chas. F. Mattinge	213						268.00					20.00	
26	Hyman Powdermaker	222				2,091.34	296.55							

Dec.	27	W. M. Moreland & Co.	225																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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Classified expenditures, Government Hospital for the Insane, for the fiscal year ending June 30, 1898—Continued.

SUBSISTENCE—Continued.

[illegible]

[illegible]

Classified expenditures, Government Hospital for the Insane, for the fiscal year ending June 30, 1898—Continued.

HOUSE FURNISHINGS, FUEL, LIGHTS, ETC.

Date.	Furnished by—	Voucher No.	Furniture, fixtures, etc.	Bedding	Table and towel linen.	Utensils, crockery, etc.	Kitchen fittings.	Laundry supplies.	Car. pots, etc.	Hard coal.	Soft coal.	Wood.	Lights, oil, etc.	Char. coal.	Grand total.
1897.															
July 10	Frederick Noebe.....	1	\$24.00				\$700.00								
14	A. J. Fish & Co.....	2													
31	Frank Hume.....	36	284.35					\$97.00							
Aug. 12	Wash. B. Williams.....	44	426.00												
18	James B. Clow & Sons.....	45													
19	Jas. N. Gunnell.....	53						33.50					\$3.50	\$12.00	
31	Frank Hume.....	61	77.02												
31	Washington Wall Paper Co.....	63	96.20												
31	W. B. Moses & Sons.....	90	20.00	\$308.63											
Sept. 18	Frederick Noebe.....	105						379.96							
30	The Christiansen Lippe Co.....	110	10.00												
30	Frederick Noebe.....	111					177.50								
et.	Barber & Ross.....	137	112.29												
22	Washington Wall Paper Co.....	139			\$36.25										
22	C. W. Hayes.....	140		137.63		\$104.52									
22	Cavanagh Bros. & Knapp.....	141													
23	Eda N. Gunnell.....	141													
23	Walter F. Hewett.....	147	20.00												
26	Wm. L. Read.....	148													
26	Johnson Bros.....	149													
27	Thomas Kelly.....	151		252.14											
27	H. Hoffa.....	153	38.50												
30	Somerset R. Waters.....	183						56.25							
Nov. 11	Washington Wall Paper Co.....	192													
12	Wash. B. Williams.....	192	2.25												
19	John W. Baker.....	195	68.16												
24	Paul Hissner & Bro.....	208		46.50											
24	The Houghson Co.....	210				35.00									
30	Frank Hume.....	217						184.00	\$115.43						
30	Frank Hume.....	234	40.00												
Dec. 11	Reed M. Beall.....	253				8.76									
11	Sweeney & Bro.....	255													
22	Washington Wall Paper Co.....	257	46.61												
	Harford Woven Wire Mat- tress Co.....	264		420.00											
21	H. G. Thomas.....	266		200.00											
22	Thos. G. Hood.....	267		419.74	387.37										
23	Johnson & Luttrell.....	274		2,675.65	111.07										
23	John E. Scott.....	283			40.60										
26	C. W. Hayes.....	287													

[illegible]

Classified expenditures, Government Hospital for the Insane, for the fiscal year ending June 30, 1898—Continued.

HOUSE FURNISHINGS, FUEL, LIGHTS, ETC.—Continued.

Date.	Furnished by—	Voucher No.	Furni- ture, fixtures, etc.	Bedding.	Table and towel linen.	Uten- sils, crock- ery, etc.	Kitchen fittings.	Laundry supplies.	Car- pets, etc.	Hard coal.	Soft coal.	Wood.	Lights, oil, etc.	Char- coal.	Grand total
1898.															
June 17	Thos. Kelly	625		\$131.32											
20	Nash Mfg. Co.	631	\$16.90												
20	H. Kaufmann & Co.	635						\$24.67							
22	F. K. Hume	641						83.75							
30	R. B. Kaufmann & Bro.	662						31.50							
30	Wash. H. Williams	664	319.17						\$23.50						
30	H. G. Thomas	683		125.50											
30	Thos. C. Hood	689		248.28	\$167.25										
30	Blum Bros.	698	185.26			\$11.00		17.34	18.90						
30	M. Silverberg & Co.	705	182.80												
30	Lansburgh & Bro.	718		3.66	228.70										
	Total		3,460.95	6,893.20	1,747.35	2,448.17	\$1,866.95	2,477.76	716.91	\$3,249.83	\$10,380.36	\$100.00	\$734.98	\$43.00	\$34,123.86

Classified expenditures, Government Hospital for the Insane, for the fiscal year ending June 30, 1893—Continued.

DRY GOODS AND CLOTHING, BOOKS, STATIONERY, AND MISCELLANEOUS.

Date.	Furnished by—	Voucher No.	Books, shoes, and slippers.	New clothing.	Clothing material.	Hats.	Notions.	Books and periodicals.	Stationery and postage.	Freight and hauling.	Incidental work, etc.	Advertising.	Electrical instruments.	Grand total.
1897.														
July 15	Washington City post-office	3							\$50.00					
21	Samuel Bieber	4		\$10.00										
29	Geo. N. Rider	6						\$3.00						
Aug. 13	Wm. H. De Lacy, notary public	37									\$23.50			
13	John Brown	39								\$47.12	25.00			
20	People's Dispatch Co.	46												
25	E. J. Brooks & Co.	55	\$10.56											
Sept. 14	Wm. H. De Lacy, notary public	88									1.75			
18	W. Yorkoff, Seamans & Benedict.	108									4.80			
30	The Department of the Interior.	113												
30	The Washington Post Co.	114												
30	John H. Metzgerott.	136												
Oct. 15	Washington City post-office	138												
18	The Department of the Interior.	155												
30	J. Baumgarten & Sons.	157												
30	Wm. Ballantyne & Sons	165												
30	People's Dispatch Co.	168												
30	B. Rich & Sons	170	199.80											
Nov. 11	Department of the Interior	191				\$61.55					106.21			
11	Meyer Bros. Drug Co.	194					\$8.40							
12	B. Y. Phippey & Co.	196												
18	The Geo. W. Knox Express Co.	203			\$570.53									
18	Philadelphia, Wilmington and Baltimore R. Co.	204								61.86				
19	Lewis S. Hayden.	205								28.00				
19	The U. S. Express Co.	206												
19	Adams Express Co.	207								60				
19	John Wanamaker.	208								7.70				
27	Jos. D. Wilson	223			214.06									
29	Peoples Dispatch Co.	227								4.03				
30	John E. Hurst & Co.	228												
19	Baltimore and Ohio R. Co.	25			518.19		112.29							
19	The Geo. W. Knox Express Co.	50												
12	The Baltimore American	1												
12	The New York Press.	2												
26	Erskine M. Sunderland	3												
30	Geo. W. Knox Express Co.	254									500.00			
Dec. 14	Wm. Wood & Co.	259						10.00		7.14				

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Classified expenditures, Government Hospital for the Insane, for the fiscal year ending June 30, 1898—Continued.

DRY GOODS AND CLOTHING, BOOKS, STATIONERY, AND MISCELLANEOUS—Continued.

Date.	Furnished by—	Voucher No.	Boots, shoes, and slippers.	New clothing.	Clothing material.	Hats.	Notions.	Books and periodicals.	Stationery and postage.	Freight and hauling.	Incidental work, etc.	Advertising.	Electrical instruments.	Grand total.
1897.														
Dec. 14	Geo. N. Rider.	260		\$185.60	\$972.79			\$6.00						
22	Thos. G. Hood.	267												
22	B. Rich & Sons	270	\$929.29											
22	Johnson & Luttrell	274		27.75	18.60									
23	John E. Scott.	282					\$14.55							
28	Guy, Curran & Co.	286					397.94							
31	Dixon, Bartlett & Co.	292	34.08									\$12.76		
22	The Washington Post Co.	7												
1898.														
Jan. 12	W. Andrew Boyd.	322						5.00						
14	Spragins, Buck & Co.	332	131.80					177.60						
15	J. W. Grumiaux	335							\$49.00					
18	Washington City post-office	339							37.38					
19	Department of the Interior	340												
20	James J. Chapman.	345						29.25						
21	Lansburgh & Bro.	346		216.66	244.38		141.07	38.52						
26	Joseph Auerbach.	348		194.13		\$82.25								
31	The United States Express Co.	353								90.65				
31	Adams Express Co.	359								.60				
24	The Evening Star	12							15.62					
26	Evening News Publishing Co.	13						5.00	10.50					
26	Wm. Wood & Co.	379							39.47					
Feb. 15	Department of the Interior	388												
21	J. P. Nawrath.	390		36.34										
21	Specialty Soap Manufacturing Co.	393					53.39							
25	Jos. D. Wilson.	402		345.00	197.46									
28	Thos. G. Hood.	406			197.61		137.70							
28	Guy, Curran & Co.	411			102.97		25.15							
28	R. P. Clark.	413			277.67		44.00							
28	People's Dispatch Co.	416								10.80				
28	Geo. W. Knox Express Co.	417								58.51				
28	Adams Express Co.	435								.40				
Mar. 11	R. A. Dismore.	437						9.00						
15	Department of the Interior	440							15.95					
16	E. Y. Pippet & Co.	441												
18	Dixon, Bartlett & Co.	442			151.73									
22	Wm. Ballantyne & Sons.	444	34.08					9.35						
24	B. Rich & Sons	448	496.00											
24	Woodward & Lothrop	449		17.00	136.87		104.46	26.70						

No.	Name	Apr.	May	June	Total
26	Sprague, Buck & Co.	461	145.02		
27	The General Fire Alarm Telegraph Co.	466			\$125.00
31	Geo. Maier & Son.....	469		28.30	
31	Interior Conduit and Insulation Co.	470			322.85
31	John Wasmaker.....	483		12.75	
31	W. H. Lowdermilk & Co.	488		39.60	
28	Erskine M. Sunderland	506			\$500.00
28	Wm. Ballantyne & Sons	514	165.00	4.50	
20	Saks & Co.....	517			
20	Washington City post-office	520			
20	J. F. Manning & Co.....	525			50.00
27	The Washington Post Co.	531		72.83	
27	Meyer Bros. Drug Co.	533		24.00	
30	Johnson & Luttrell.....	543	24.74		
30	John E. Hurst & Co.....	544	616.85	136.28	
30	People's Dispatch Co.	554			2.05
30	W. Leslie Ryan & Co.	584			96.00
31	John E. Scott.....	590	13.40	7.68	
31	Adams Express Co.	600			4.00
31	The United States Express Co.	601			3.45
31	Baltimore and Ohio R. R. Co.	602			1.35
31	Western Telephone Construction Co.				
Apr. 30					
17	B. Y. Pippey & Co.	622			59.00
20	The Bristol Company.....	626	580.94		
21	Jos. D. Wilson.....	632			54.00
21	Department of the Interior	636	328.61		
29	Wyckoff, Seamans & Benedict	644		34.48	
29	Department of the Interior	646		18.50	
30	Thos. G. Hood.....	647		8.25	
30	Specialty Soap Manufacturing Co.	689	346.72		
30	Max Frank.....	690		18.00	
30	Samuel Bieber.....	694	46.65		
30	Blum Bros.....	697	1,063.00		
30	J. P. Nawrath.....	698	129.20		
30	B. Rich & Sons.....	699	26.88		
30	Adams Express Co.	706			1.55
30	Sprague, Buck & Co.....	713	103.50		
30	M. Du Perow.....	715	25.20		
30	E. Morrison Paper Co.	716			73.43
30	Lansburgh & Bro.	717		280.88	
30	Guy, Curran & Co.	718	5.07	67.39	
30		719	48.02	4.25	
	Total	2,126.68	2,368.40	5,678.96	201.80
				1,415.65	590.94
				827.34	371.30
				1,060.05	71.89
					634.28
					\$15,336.60

Classified expenditures, Government Hospital for the Insane, for the fiscal year ending June 30, 1898—Continued.

MEDICAL SUPPLIES, EXPENDED FOR AMUSEMENT OF PATIENTS, ETC.

Date.	Furnished by—	Voucher No.	Drugs, medicines, etc.	Alcoholic stimulants.	Instru-ments, etc.	Returning cloped patients.	Amuse-ment of patients.	Sending to their homes.	Dental supplies.	Musical instru-ments, etc.	Grand total.
1897.											
Aug. 16	J. McNeely	41					\$20.00				
30	Brentano's	52									
31	Edw. S. Schmid	56	\$63.25								
Sept. 4	Abraham Webster	83					5.00				
13	B. C. Gates	86					2.75				
13	W. H. Adams	87					2.75				
21	Willie Howard	94					5.00				
22	L. Griffith	95					5.00				
22	Wm. Kennedy	96					5.00				
22	Wm. Cook	97					5.00				
29	Alexander Henson	102									
30	Smith, Kline & French Co.	107	20.60								
30	M. J. Quinn, clerk.	109					57.23				
30	O. J. Wise	134						\$18.00			
Oct. 25	H. Brooke	145					5.00				
27	T. H. McAllister	150									
27	Melville Lindsay	152									
27	H. Hoffa	153									
27	Wm. A. Gammell	189									
Sept. 9	Meyer Bros. Drug Co.	194	45.70								
Nov. 11	Scheller & Stevens	210	164.55								
23	Henry H. Netter	214									
23	Edw. S. Schmid	256		\$658.84							
Dec. 11	Parke, Davis & Co.	258	75.00								
11	Bland Bros. & Wright	258	100.38								
21	W. M. Galt & Co.	269	6.00								
22	E. F. Houghton & Co.	284	22.00								
24	Andrew Day	285					5.00				
27	J. C. Simpson	318									
Dec. 11								65.50			
1898.											
Jan. 13	Shoemaker & Busch	323	254.28								
14	Edw. S. Schmid	327	75.00								
14	Chas. Fischer	328			9.06						
14	Henry Eberbach	330								\$1.00	
15	M. J. Quinn, chief clerk	336									
19	Z. D. Gilman	341	221.78				62.92				
20	Browning & Middleton	360		157.59							
Feb. 3	James H. Williams	378									
10	The Humane Restraint Co.	386			16.50		5.00				
21	J. P. Nawrath	390			66.30						

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Classified expenditures, Government Hospital for the Insane, for the fiscal year ending June 30, 1898—Continued.

FARM, GARDEN, AND STABLE.

Date.	Furnished by—	Voucher No.	Feed.	Imple- ments, horseshoes, etc.	Plants and seeds.	Manures.	Live stock.	Harness and repairs.	Vehicles and repairs.	Hay and straw.	Incidental expenses.	Grand total.
1897.												
July 29	James A. Beall.....	7		\$16.00					\$161.75			
30	James Campbell.....	8										
31	John B. Daish.....	15	\$141.00								\$12.00	
Aug. 31	Peter Paul.....	17					\$550.00					
	E. J. Harris.....	35						\$10.00				
Aug. 13	W. J. G. Sherman.....	38					4.00					
14	John B. Daish.....	40										
17	Oliver H. Miller & Bro.....	42										
20	Robert Boyd.....	47		5.20							7.00	
21	John D. Miller.....	48									55.00	
21	Edna S. Schmidt.....	56										
21	Saml. Reusinger.....	57		26.10			118.35				3.00	
21	John B. Daish.....	60	94.00									
21	Frank Boyden.....	84										
Sept. 8	H. P. Pillsbury.....	89	555.00							\$372.98		
17	J. B. Fellows & Co.....	91		5.00			5.50					
20	L. H. Fowler.....	92					4.00					
20	Chas. L. Flanigan.....	93					100.00					
20	W. C. Jones.....	135										
Oct. 11	W. M. Galt & Co.....	154	602.50									
27	John B. Daish.....	159	383.06									
30	James A. Beall.....	180										
30	H. P. Pillsbury.....	181	585.00						\$263.75			
30	W. M. Galt & Co.....	183	180.75							298.94		
30	N. Stander.....	189			45.00							
Nov. 11	F. Shea.....	183					450.00					
15	Geo. J. Burkhardt's Sons.....	199		21.00								
15	J. W. Bartley.....	201										
15	N. Humphrey.....	202		25.20								
23	W. H. Douglas.....	212		57.50								
24	Thos. W. Riley.....	218				\$352.85						
24	James A. Beall.....	220							239.25			
Dec. 22	W. M. Galt & Co.....	260	294.57									
23	John B. Daish.....	271	148.88									
23	James A. Beall.....	272							548.00			
28	Louis Hartig.....	276										
28	R. S. Burke.....	277		32.50								
28	Robert Brown.....	278									75.10	
28	The Mineralized Rubber Co.....	279		38.25							9.00	
29	W. J. Brooke & Co.....	289	6.00		170.76			34.50				
31	Barber & Rose.....	298		72.00								

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Classified expenditures, Government Hospital for the Insane, for the fiscal year ending June 30, 1898—Continued.

REPAIRS AND IMPROVEMENTS.

Date.	Furnished by—	Voucher No.	Lumber, doors, etc.	Hard-ware, etc.	Engi-neers and plumb-ers' sup-plies.	Paints, oils, glass, etc.	Roof-ing.	Iron-work, etc.	Sundry small repairs.	Masons' supplies.	Electrical supplies.	Fire and other appa-ratus.	Building.	Grand total.
1897.														
July 27	R. F. Bradbury	45								\$108.00				
21	Chas. White & Co	1						\$973.94						
Aug. 81	E. N. Gray & Co	53						9.00						
12	S. M. Frasier	47								47.10				
12	do	48								3.00				
12	do	49								7.90				
12	do	626								22.00				
12	do	627												
12	Frank Libbey & Co	628	\$42.60								\$51.00			
31	M. Du Perow	1	136.79											
21	Church & Stephenson	2	86.69								90.00			
26	Geo. A. Shehan	3												
20	John Miller	4												
21	Edw. Whalley	5												
21	Church & Stephenson	6	172.20			\$14.62	\$23.47							
26	Geo. A. Shehan	7	873.98											
31	Thos. Banks & Co	8												
31	Dufur & Co.	99						178.08	\$154.75					
25	Robert Brown	100							28.90					
27	M. Du Perow	111									\$81.40			
30	Barber & Ross.	10		\$94.00										
27	M. Du Perow	11												
30	Barber & Ross.	12						627.10						
30	H. A. Herrell & Co.	629									447.50			
do	do	167			\$4.50					277.95				
Oct. 30	Wm. Z. Edelin	171	76.20							776.57				
30	W. T. Galliter & Bro	14												
16	Jouvenal & Smith	15												
18	R. F. Bradbury	16								141.44				
30	Cuyler & Moller	17			543.58					77.85				
30	Caro E. Kerslaw	18												
30	N. K. Hatton	19							9.00					
30	The Grove Lime and Coal Co	8												
30	Barber & Ross.	200					120.00			367.50				
Nov. 13	C. A. Woolsey Paint and Color Co	215				407.34								
23	do	221				4.10								
24	Church & Stephenson	221												
24	Thompson C. Gill & Co	227	231.04											
27	Francis Miller	230		99.73										
30						18.00								

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Classified expenditures, Government Hospital for the Insane, for the fiscal year ending June 30, 1898—Continued.

REPAIRS AND IMPROVEMENTS—Continued.

Date.	Furnished by	Voucher No.	Lumber, doors, etc.	Hard-ware, etc.	Engi-neers and plum-bers' sup-ples.	Paints, oils, glass, etc.	Roof-ing.	Iron-work, etc.	Sundry small repairs.	Masons' supplies.	Electrical supplies.	Fire and other appa-ratus.	Building.	Grand total.
1898.														
Feb. 28	Wm. F. Brown.....	20			\$128.00									
Mar. 25	Baldwin & Peake.....	21			18.26								\$5,173.00	
Mar. 25	Barber & Ross.....	455												
Mar. 25	W. T. & F. B. Weaver.....	457		\$68.92										
31	James B. Clow & Sons.....	465			666.00									
31	Wm. H. Wilkinson & Co.....	472			6.60									
31	Hugh Reilly.....	476				\$173.09								
31	M. T. Davidson.....	479			31.20									
31	Standard Oil Co.....	480				48.36								
31	Frank Richter & Co.....	483							\$975.00					
16	Cuyler & Mohler.....	40			195.00									
25	James B. Lambie.....	41		\$6.96					7.22					
31	J. E. Hurley.....	42							431.80					
31	Barber & Ross.....	23												
31	Geo. A. Sheehan.....	25	\$66.00								\$366.50			
31	Sprague Electric Co.....	26												
31	Baldwin & Peake.....	27							\$212.18				6,132.00	
31	J. H. Chesley & Co.....	10												
31	Frank Libbey & Co.....	521	232.39			9.75								
Apr. 22	Meyer Bros. Drug Co.....	531												
Apr. 29	The Phillip Carey Manufac-turing Co.....	541			236.68									
30	Frank Libbey & Co.....	29	121.94											
30	Smooth On Manufacturing Co.....	30			68.00								4,900.00	
30	Baldwin & Peake.....	31												
30	Frank Libbey & Co.....	43	122.17											
22	Frank Libbey & Co.....	44								\$89.00				
23	J. T. Walker & Sons.....	44			4.50									
May 19	F. C. Baird.....	574				658.59								
21	Geo. F. Muth & Co.....	592												
31	Frederick Rose.....	599												
31	Geo. F. Muth & Co.....	28				40.51								
13	Geo. F. Muth & Co.....	33		57.83										
31	Geo. A. Sheehan.....	34	168.84											
31	Church & Stephenson.....	35												
31	Baldwin & Peake.....	35												
31	J. W. Tolson.....	648	8.00	60.00									4,262.53	
June 30	C. A. Woolsey Paint and Color Co.....	666			170.08	360.88								
10	Cuyler & Mohler.....	46												

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Classified expenditures, Government Hospital for the Insane, for the fiscal year ending June 30, 1898—Continued.

SALARIES AND WAGES—Continued.

Date.	Furnished by—	Voucher No.	Superintendent, physicians, and general office.	Ward service.	Inside domestic department.	Engineers' department.	Farm and garden, hauling coal, drivers, etc.	Mechanics and helpers.	Making clothing.	Laundry.	Sunday service.	Grand total.
1897.												
Nov. 30	Pay roll, support.....	242		\$802.03								
30	do	243		298.63								
30	do	244		940.29								
30	do	245		439.18								
30	do	246			\$1,108.00							
30	do	247			612.38							
30	do	248			316.97							
30	do	249										
30	do	250					\$1,206.40			\$365.54		
30	do	251					789.14					
30	do	252				\$1,280.60		\$706.82				
30	Pay roll, repairs.....	26						1,262.11				
30	do	27						158.40				
30	do	5						994.44				
30	do	6						453.40				
Dec. 17	Ida L. Berry.....	261							\$3.00			
22	Katie Ridgely Barclay.....	268							8.50			
31	Kate Goodwin.....	300							6.00			
31	Pay roll, support.....	302	\$1,948.45	674.45								
31	do	303		1,272.75								
31	do	304		1,225.61								
31	do	305		1,086.25								
31	do	306		744.00								
31	do	307		318.17								
31	do	308		980.40								
31	do	309		471.86								
31	do	310			1,129.87							
31	do	311			613.97							
31	do	312			314.21							
31	do	313										
31	do	314					1,246.80					
31	do	315					910.30					
31	do	316				1,336.70		539.91				
31	do	317						551.75				
31	Pay roll, buildings and grounds.....	10						512.70				
31	Pay roll, repairs.....	30										
1898.												
Jan. 22	M. McInturf.....	342							6.00			
22	Ida L. Berry.....	347							6.00			

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Classified expenditures, Government Hospital for the Insane, for the fiscal year ending June 30, 1898—Continued.

SALARIES AND WAGES—Continued.

Date.	Furnished by—	Voucher No.	Superintendent, physicians, and general office.	Ward service.	Inside domestic department.	Engineers' department.	Farm and garden, raising coal, drivers, etc.	Mechanics and helpers.	Making clothing.	Laundry.	Sunday service.	Grand total.
1898.												
Mar. 31	Pay roll, support.....	500								\$594.86		
31	do.....	501					\$1,302.35					
31	do.....	502					710.35					
31	do.....	503				\$1,306.40		\$649.80				
31	do.....	504					1,133.00	566.85				
31	Pay roll, buildings and grounds.....	28							\$3.00			
Apr. 27	M. McInturf.....	526							6.00			
30	Ellis J. Ficklin.....	537							6.00			
30	Kate Goodwin.....	546										
30	Pay roll, support.....	550	\$1,886.30	\$667.75								
30	do.....	551		1,261.10								
30	do.....	552		1,123.00								
30	do.....	553		1,106.92								
30	do.....	554		743.46								
30	do.....	555		310.69								
30	do.....	556		924.90								
30	do.....	557		514.76								
30	do.....	558			\$1,102.19							
30	do.....	559			536.30							
30	do.....	560			370.55							
30	do.....	561										
30	do.....	562					1,246.90					
30	do.....	563					695.80					
30	do.....	564						538.95				
30	do.....	565				1,388.50	1,179.40					
30	Pay roll, buildings and grounds.....	32										
May 11	Laura Brauman.....	569										
20	Louisa M. Cross, mother.....	576							6.00			
21	Ida L. Berry.....	578	26.37						6.00			
31	Joseph K. Davidson.....	604		7.91								
31	do.....	605	1,909.53	689.50								
31	do.....	606		1,302.80								
31	do.....	607		1,192.88								
31	do.....	608		1,130.72								
31	do.....	609		754.76								
31	do.....	610		344.36								
31	do.....	611		553.97								
31	do.....	612										

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Detailed statement of receipts and expenditures for the fiscal year ending June 30, 1838.

RECEIPTS.

Appropriation for—	
Support	\$264,721.04
Repairs and improvements	15,000.00
Repairs and improvements, deficiency	1,200.00
Buildings and grounds	93,000.00
District of Columbia, board	109,278.96
Miscellaneous receipts	23,174.50
On hand, buildings and grounds	3,814.16
	<hr/>
	10,188.66
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EXPENDITURES.

Subsistence:	
Flour, meal, crackers, etc.	\$14,031.35
Ice	4,998.87
Butter, cheese, and eggs	23,861.45
Fresh meat	24,676.07
Salt and smoked meats	8,904.13
Fish and poultry	8,968.16
Tea and coffee	7,641.22
Sugar, molasses, etc.	7,321.10
Lard	937.79
Fruit and vegetables	8,405.60
Other groceries	11,915.67
	<hr/>
	121,661.41
House furnishing, fuel, lights, etc.:	
Furniture, fixtures, etc.	3,460.95
Bedding	6,893.20
Table and towel linen	1,747.35
Utensils, crockery, etc.	2,448.17
Kitchen fittings	1,866.95
Laundry supplies	2,477.76
Carpets, etc.	716.31
Hard coal	3,249.83
Soft coal	10,380.36
Wood	100.00
Lights, oils, etc.	734.98
Charcoal	48.00
	<hr/>
	34,123.86
Dry goods and clothing, books, stationery, and miscellaneous:	
Boots, shoes, and slippers	2,126.68
New clothing	2,358.40
Clothing material	5,678.36
Hats	201.80
Notions	1,415.65
Books and periodicals	590.94
Stationery and postage	827.34
Freight and hauling	371.30
Incidental work, etc.	1,060.05
Advertising	71.89
Electrical instruments	634.28
	<hr/>
	15,336.69
Medical supplies, expended for amusement of patients, etc.:	
Drugs, medicines, etc.	1,879.95
Alcoholic stimulants	1,055.28
Instruments, etc.	228.18
Returning eloped patients	85.50
Amusement of patients	1,762.44
Sending to their homes	142.95
Dental supplies	42.14
Musical instruments, etc.	1.00
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	5,197.44
Farm, garden, and stable:	
Feed	7,402.12
Implements, horseshoes, etc.	880.02
Plants and seeds	793.23
Manures	749.04

Farm, garden, and stable—Continued.

Live stock	\$2,483.35	
Harness and repairs	462.65	
Vehicles and repairs	1,545.23	
Hay and straw	942.42	
Incidental expenses	214.10	
		\$15,472.16

Repairs and improvements:

Lumber, doors, etc	4,048.62	
Hardware, etc	997.16	
Engineers and plumbers' supplies	5,553.34	
Paints, oils, glass, etc	2,737.17	
Roofing	153.47	
Ironwork, etc	2,024.89	
Sundry small repairs	2,534.90	
Masons' supplies	2,635.63	
Electrical supplies	6,899.85	
Fire and other apparatus	223.42	
Building	36,737.53	
		64,545.98

Salaries and wages:

Superintendent, physicians, and general office	23,004.89	
Ward service	80,017.72	
Inside domestic department	24,510.29	
Engineers' department	15,574.01	
Farm and garden, hauling coal, drivers, etc	39,296.19	
Mechanics and helpers	21,313.01	
Making clothing	209.50	
Laundry	6,971.95	
Sunday service	500.00	
		211,397.56

On hand:

Support	107.72	
Repairs and improvements	128.35	
Buildings and grounds	42,213.30	
		4.19

Covered into United States Treasury, on buildings and grounds.....**510,188.66***Itemized receipts.***1897. Cash received for—**

July 31. Sale of stock, etc	\$190.87	
Aug. 31. Sale of stock, etc	169.16	
Sept. 7. Board of Walter H. Chew	25.00	
8. Board of M. A. Gilleland	27.37	
8. Board of Jos. P. Hutchins	72.00	
8. Board of Harlow Underhill	30.00	
14. Board of Wm. H. Hindes	65.00	
16. Board of Mary E. Webster	65.00	
25. Board of Johanna Wurdemann	30.00	
27. Board of Rufus E. Wilcox	65.00	
30. Board of Francis M. Cook	65.00	
30. Board of United States Soldiers' Home patients	985.71	
30. Board of John L. Diggins	45.00	
30. Sale of stock, etc	95.00	
Oct. 12. Board of John A. Cutter	58.50	
12. Board of Walter H. Chew	25.00	
20. Board of Carrie L. Hotchkiss	25.00	
25. Board of John G. Hildt	65.00	
27. Board of Bryan Hall	65.00	
27. Board of Frank B. Hayes	130.00	
30. Special attendance, Rollin Perkins	150.00	
30. Board of Chas. K. Yancey	91.00	
30. Board of Marine-Hospital Service	1,530.00	
30. Sale of stock, etc	196.75	
Nov. 11. Board of Earl S. Stone	65.00	
12. Board of Jas. Hauke	65.00	
12. Board of Wm. H. Zepp	182.00	
18. Board of J. M. B. Clitz	285.71	
29. Board of Julia Daniel	136.00	
30. Board of Wm. Gammell	86.50	

1897.		Cash received for—	
Nov.	30.	Board of Bobtail Bear	\$91.00
	30.	Board of Jos. D. Marshall	91.00
	30.	Board of Frank White	91.00
	30.	Board of Chu-e-rah-rah-he-kah	91.00
	30.	Sale of stock, etc	267.33
Dec.	10.	Board of A. D. McCall	130.00
	18.	Special attendance, G. F. Morrison	25.20
	20.	Board of Rufus E. Wilcox	65.00
	27.	Board of Edward Lake	65.00
	27.	Board of Harlow Underhill	30.00
	27.	Board of Joseph P. Hutchins	72.00
	27.	Board of Benj. F. Ellis	130.00
	30.	Board of Silas Holmes	12.00
	31.	Board of United States Soldiers' Home patients	1,094.28
	31.	Sale of stock, etc	15.06
1898.			
Jan.	6.	Board of Francis M. Cook	65.00
	8.	Board of J. L. Diggins	40.00
	10.	Board of Rollin Perkins	75.00
	10.	Board and special attendance, Edward Burchell	171.59
	13.	Board of Mary E. Webster	65.00
	18.	Board of John A. Cutter	58.50
	19.	Board of Carrie Hotchkiss	20.00
	19.	Board of Van W. Weaver	65.00
	19.	Board of Alpheus Weaver	65.00
	22.	Board of Wm. C. Strong	182.00
	24.	Board of Chas. K. Yancey	91.00
	28.	Board of Marine-Hospital Service	1,513.00
	31.	Board of Frank P. Davis	65.00
	31.	Board of Martha A. Gilleland	27.37
	31.	Sale of stock, etc	316.33
Feb.	4.	Board of Carrie L. Hotchkiss	24.00
	5.	Board of Frank B. Hayes	65.00
	15.	Board of Earl S. Stone	65.00
	15.	Board of James Hauke	65.00
	28.	Board of Mary L. Goucher	30.00
	28.	Sale of stock, etc	117.95
Mar.	10.	Board of Asa D. McCall	65.00
	18.	Board of Rufus E. Wilcox	65.00
	21.	Board of Edward Lake	65.00
	21.	Special attendance, G. F. Morrison	25.20
	23.	Board of Joseph P. Hutchins	72.00
	23.	Board of Harlow Underhill	30.00
	24.	Board of Mary E. Webster	65.00
	31.	Board of Alexander Van Loan	190.00
Apr.	2.	Board of United States Soldiers' Home patients	1,230.71
	6.	Board of John L. Diggins	45.00
	7.	Board of John A. Cutter	58.50
	7.	Board of Van Wyck Weaver	65.00
	7.	Board of Alpheus W. Weaver	65.00
	7.	Board of Francis M. Cook	65.00
	9.	Board of Frank P. Davis	65.00
	12.	Board of S. C. Borrows	325.00
	14.	Board of Walter H. Chew	16.44
	23.	Board of Marine-Hospital Service	1,472.79
	25.	Board of Carrie Hotchkiss	23.55
	27.	Board of Charles K. Yancey	91.00
	27.	Incidentals, George F. Morrison	24.65
	27.	Sale of stock, etc	435.50
May	3.	Board of Bryan H. Hall	130.00
	12.	Board of Earl S. Stone	65.00
	13.	Board of David G. Crippin	36.00
	19.	Board of Chu-e-rah-rah-he-kah	182.00
	19.	Board of Frank White	182.00
	19.	Board of Bobtail Bear	182.00
	19.	Board of Jos. D. Marshall	182.00
	19.	Board of William R. Truxton	70.00
	28.	Board of S. C. Borrows	650.00
	31.	Board of Caroline L. Hotchkiss	32.27

1898.	Cash received for—	
May 31.	Sale of stock, etc	\$182.70
June 6.	Special attendance, Rollin Perkins	75.00
	16. Board of Harlow Underhill	30.00
	16. Board of Joseph P. Hutchins	72.00
	17. Board of Frank Ralibowski	130.00
	17. Board of Edward Lake	65.00
	20. Board of Rufus E. Wilcox	65.00
	23. Board of Julia Daniel	150.00
	24. Board and special attendance, Edward Burchell	421.98
	24. Board of Jas. H. Orr	200.00
	30. Board of Maria Egli-ok	130.00
	30. Board of Van Wyck Weaver	65.00
	30. Board of Alpheus W. Weaver	65.00
	30. Board of United States Soldiers' Home patients	1,300.00
	30. Board of A. D. McCall	65.00
	30. Sale of stock, etc	151.85
	30. Board of Francis M. Cook	65.00
	30. Special attendance, Geo. F. Morrison	24.93
	30. Board of C. K. Yancey	91.00
	30. Board of John A. Cutter	58.50
	30. Board of L. H. Stone	154.00
	30. Board of L. H. Stone	91.00
	30. Board of H. H. Ketchum	70.00
	30. Board of J. L. Diggins	45.00
	30. Board of Bryan Hall	65.00
	30. Board of Chu-e-rah-rah-he-kah	91.00
	30. Board of Jos. D. Marshall	91.00
	30. Board of F. White	91.00
	30. Board of Bob-tail Bear	91.00
	30. Board of Marine-Hospital Service	1,559.00
	30. Board of F. P. Davis	65.00
	30. Board of Susan Linkins	260.00
	30. Special attendance, Rollin Perkins	75.00
	30. Sale of stock, etc	93.15
	30. Board of Frank B. Hayes	65.00
	30. Board of Earl S. Stone	65.00
	30. Disallowance .....	.60
	Total	23,174.50

MEDICAL SUPPLEMENT
TO THE
FORTY-THIRD ANNUAL REPORT
OF THE
GOVERNMENT HOSPITAL FOR THE INSANE.

1898.

919



ST. ELIZABETH—"THE REST" (PATHOLOGICAL BUILDING), 1884.

MEDICAL REPORT OF THE SUPERINTENDENT.

As the annual report of the Board of Visitors is prepared in the autumn, although the financial year closes with the 30th of June, it has been thought desirable to bring the medical history as near to the time of writing as possible, and this record is accordingly brought down to the close of September, 1898. The result is we are this year able to present some most gratifying statistics on the curability of recent insanity, and to demonstrate that what has in later years come to be regarded as the mythical claim of the early days of insane hospitals, viz., the cure of a large majority of the recent cases, and been sneered at as only representing the personal equation of the pioneer superintendent's mind, too sanguine in its expectations, was after all only a statement of the simple truth of the eminent curability of acute insanity in cases uncomplicated with organic brain disease and hereditary degeneration.

The war with Spain in April last called a quarter of a million of men from the peaceful pursuits of life into armed camps, changing their whole mode of existence. These men all underwent physical examination before acceptance, thereby insuring the best material for soldiers. In these changed conditions of life, under hardships, sickness, and exposure, the bodily health, and sometimes the mind, gave way, and a considerable number of these reached the Government Hospital for the Insane as active insane cases. From April 25 to September 30, 1898, there were admitted of these recent cases from the Army and Navy 47 men. Deducting 4, who were found to have been previously inmates of insane hospitals, there remained 43 recent cases. Of these 1 died, 16 have recovered and been discharged, 10 have recovered and are only awaiting their final statements to be discharged. Of the 20 remaining under treatment only 5 show no improvement. Out of the 15 who have improved in their mental condition, it is reasonable to be hoped that some will recover. But assuming that all of these cases are likely to be permanent, more than 62 per cent of the whole number of acute cases have already made good recoveries.

In the Sahara of hereditary degeneration and organic brain disease from the outset that stretches so limitlessly across the vista of our latter-day types of insanity this reversion to the earlier and more curable forms is most cheering, and the result is a compensation even for the discomfort and the overcrowding of the hospital. It is noticeable that 13, or nearly one-third, of these cases followed directly upon malarial or typhoid fever.

The prevailing type of disease at St. Elizabeth is still malarial, but we note that while the summer of 1898 has been excessively hot, and that heat almost continuous, the intermittent attacks have been by no means as general or persistent as in the previous last three or four years, although there is a marked increase with the coming of cool nights. There has been no filling or special disturbance of the river flats, and this may have had a saving grace. "*Quieta non movere.*" The improvement is at best but only relative. Quinia is still the sheet anchor, and the medical internes microscopically testing the blood of the supposed immunes have been unable to find anyone free from the

malarial protozoa, although the intermittent paroxysm may be apparently wanting. It is perhaps proper to say here that we have during the present season availed ourselves of the assistance of medical internes temporarily appointed to assist in the clinical hospital work. It is an assistance to the regular staff in urinary analysis, microscopic examinations, note registration, and the minute study of individual cases, while it affords recent graduates an opportunity to prosecute their pathological studies and at the same time acquire some general knowledge of the different types of mental disease. Dr. George H. Schwinn and Dr. Thomas Dowling, jr., are the present internes and are much interested in the work.

The hydrotherapeutic work has been continued and its field considerably extended, with very encouraging results. The apparatus in use is essentially that of Dr. S. Baruch, of New York City, supplemented with massage, packs, and enforced rest, and has been sufficiently described in previous reports. With larger facilities we have simply continued to extend the range of cases treated, and the success has been such as to lead us to hope that we have only begun to realize the benefit that will result, even in chronic cases, from its continued administration under intelligent, discriminating supervision. I earnestly commend it to the medical men who are in a position to understand the need in this direction and to decide authoritatively upon the merits of the treatment proposed.

As it has not been practicable to submit any pathological report at this time, I have requested Dr. George W. Foster, who has charge of the hydrotherapeutic work, to prepare a more extended report of individual cases treated than has hitherto been done, showing results as he sees them up to the present time. The parietic cases mentioned in my reports of 1896 and 1897 are still followed in Dr. Foster's summary. I feel sure his whole report will be read with interest. I think his facts bear out his conclusions.

W. W. GODDING,
Superintendent.

GOVERNMENT HOSPITAL FOR THE INSANE,
September 30, 1898.

REPORT UPON THE RESULTS OF HYDROTHERAPY.

GOVERNMENT HOSPITAL FOR THE INSANE,
Washington, D. C., October 1, 1898.

SIR: I have the honor to report the following results of treatment by hydrotherapy since August, 1897, in the department under my charge.

The whole number of patients who have received this treatment is 84.

Since opening the rooms containing the special apparatus for this work, May 5, 1898, an average of 55 daily treatments have been given, excluding Sundays, when it is not in use.

Of the whole number treated 14 are paretics and 12 epileptics.

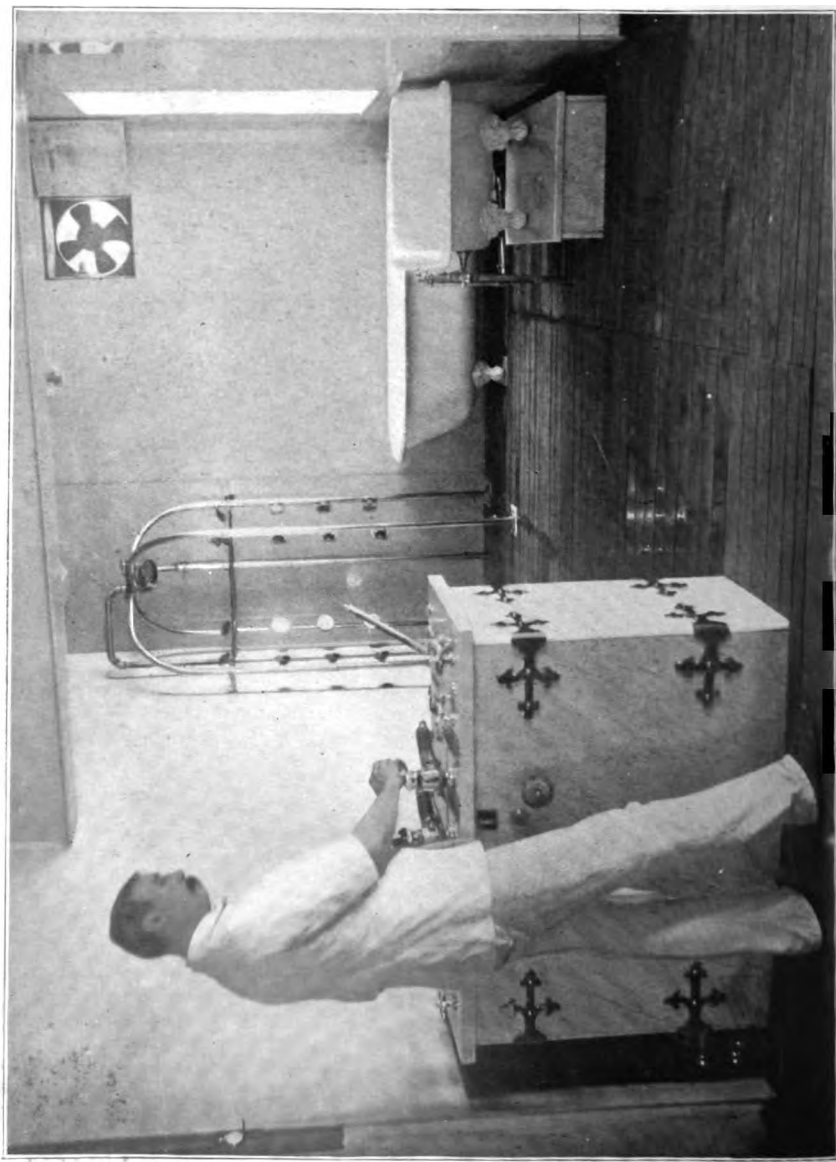
Patients in these two classes will be considered in detail later in this report.

Of the whole number of individuals under treatment, 2 have died; 1, an old man, some months after transfer to another department; the other, of miliary tuberculosis.

In but 20 cases of the entire number had mental disease existed less than one year prior to beginning of treatment, and of these 5 were more than 60 years of age.

Of the 20, 7 have recovered; 3 are improving rapidly, and apparently near recovery; 4 are much improved, and still improving; 3 are improved, but in an early stage of treatment; and 4 are paretics, and will be spoken of later.

Of the 7 recoveries, 3 had acute mania; 2 acute dementia, confusional type: 1 acute melancholia; and 1 was a morphinist. One patient also made a good recovery from melancholia of eighteen and one-half months duration prior to beginning treatment; having remained under treatment six months, though recovered at the end of four months.



ST. ELIZABETH HYDROTHERAPEUTIC APPARATUS.

After deducting those who are recovered, or dead, the acute cases, the paretics and epileptics, there remains a miscellaneous class numbering 35. These have been subjected to the treatment for its tonic-revulsive or sedative effects, either general or local, determined by the exigencies of the individual case. It would be tedious to mention these in detail, and I will merely mention a few that may for some reason merit a special notice.

A case of traumatic myelitis of lumbar spine, of eight years' duration, with severe pain in back and legs, frequently extending to the head, with much flushing of the face, and intractable insomnia, culminated in an attack of confusional insanity, for which he was sent to the hospital for treatment. Motor and sensory functions were much impaired in both legs, and especially in the left. In this case the mental symptoms are entirely relieved; there is very rarely any headache; and the symptoms, except the motor, are all very much relieved. The methods employed in this case are the Scotch douche; a modification of this by substituting the needle douche at 110 to 115 degrees for the fan douche of the same temperature, and alternating with the fan douche at 60 degrees; and local wet pack at 70 degrees, well covered, and worn during the night.

In two cases of *tabes dorsalis* the pains have been notably relieved by the Scotch, or the alternating douche, as they have in two cases of alcoholic multiple neuritis, chiefly affecting the lower extremities. Another case of multiple neuritis, in an attendant, of general character and of great severity, was much benefited by wet-pack at 75 to 80 degrees of one to one and one-half hours' duration daily or twice a day, and made a complete recovery. Two cases of *neurasthenic melancholia* have been decidedly benefited by a combination of tonic and sedative methods; an ordinary treatment, consisting of hot-air bath (exclusive of head) until slight perspiration; shampoo with sprinkler-douche, beginning at 80 degrees, rising quickly to 90 to 95 degrees, five to fifteen minutes' duration, and ending with fan-douche at 60 degrees ten to twenty seconds.

The greater number of these 35 have required treatment for the results of mal-nutrition having various forms and causes. It is regretted that the results in these cases can not be expressed in *avoidupois* or blood counts. An effort will be made to do this during the coming year, at least in representative cases. In the absence of precise data of comparison, I will only say that, while individuals have, as a matter of course, varied in the degree of benefit received, there are none who have not shown gratifying results. The latter are most commonly seen in improved color, flesh, and vigor, and in the abatement of "nervous" symptoms.

CASES OF EPILEPSY.

Passing to the 12 cases of epilepsy: We have a positive criterion of progress in the frequency and violence of the fits. It will be therefore mainly in reference to this point that results will be given, though the natural inference would be a correct one, that commensurate improvement has occurred in the other symptoms. The following cases, selected by no definite plan, are all that have thus far received treatment.

Case 1.—T. F. S. K. Patient 54 years of age; has had fits twenty-five years; moderate dementia; moderate anemia and emaciation; imperfect digestive functions; diarrhoea or constipation quite frequent. Hydric treatment began May 3, 1898. Total fits for eleven months, 46; monthly average, $4\frac{1}{3}$; total fits since May 3, 1898, five months, 4; monthly average, $\frac{4}{5}$; percentage of gain, 80.

There is some general improvement in all the symptoms noted at beginning of treatment, with considerable room for improvement left.

Case 2.—A. P. T. Patient 17 years of age; has had fits fifteen years; masturbates; much dementia; vacant expression; cachectic in appearance. Total fits for four months prior to treatment, 62. Hydric treatment began November 12, 1897. Total fits for ten months since, 130; monthly average, 13; percentage of gain, 12.9. In this case masturbation continues, and has been proved a direct excitant of convulsions. Has gained notably in weight, color, animation, and expression.

Case 3.—R. F. Patient 51 years of age; duration of fits, seven years; during this period has been subject to successive fits, continuing through several days, attended with maniacal excitement and suicidal tendencies. Emaciated; cachectic. Previous to hydric treatment spent two-thirds of his time in bed, with prostration and confusion and vertigo produced by epileptic paroxysms. Total fits for three months (the extent of our records), 20; average per month, $6\frac{2}{3}$; total fits since beginning hydric treatment, September 4, 1897, thirteen months, 54; monthly average, $4\frac{2}{3}$; gain per cent, 37.7.

Patient's attacks are much lighter; has gained 12 pounds in weight, and is not confined to bed more than one to three days by epileptic seizures and their results. His gain is marked in all symptoms.

Case 4.—J. J. C. Patient 54 years of age; duration of fits, fourteen years; cause, intemperance. Moderate dementia; ruddy color; body stout and fat.

Hydric treatment began March 30, 1898. Total number of fits for six months preceding treatment, 33; monthly average, $5\frac{1}{2}$; total fits for six months during treatment, 19; monthly average, $3\frac{1}{2}$; percentage of gain, 39.3. Intemperance is mentioned as a cause on account of its unfavorable indication in prognosis.

Case 5.—P. S. M. Patient, 42 years of age; duration of fits, twenty-four years. Has had four attacks of acute epileptic mania, the last two occurring, respectively, in September and December, 1897. The latter attacks more severe and longer continued. There have occurred slight symptoms of unbalanced mental action on one or two occasions since recovery from the December, 1897, attack, but the symptoms have been transient. Slight dementia; complexion pale; expression somewhat harassed and anxious. Body fairly well nourished. For a year before admission friends state his attacks averaged three per week, or thirteen per month. Treatment began December 9, 1897. Total number of fits in ten months, 52; monthly average, $5\frac{1}{2}$; average per cent of gain, 60. There has been a gain of 20 pounds in weight; flesh is hard and color bright; expression, alert and cheerful.

Case 6.—W. H. M. Patient, 55 years of age; duration of fits, thirty-six years. Form, thickset; face, pale; expression, querulous; much demented; cross and scolding after fits.

Hydric treatment began May 3, 1898. Total fits in five months preceding treatment, 57; total fits in five months during treatment, 49; average monthly for former period, $11\frac{1}{2}$; average monthly for latter period, $9\frac{1}{2}$; average per cent of gain, 14; total fits of the last three months are 22, with an average per month of $7\frac{1}{2}$. There is a marked general improvement, mental and physical, in this case.

Case 7.—W. W. Patient, 61 years of age; duration of epilepsy, thirteen years; confined to bed; great enfeeblement of mind and body; thin, anæmic; memory almost totally lost; perceptions and reasoning faculties lost in a corresponding degree.

Hydric treatment began May 3, 1898. Total number of fits in four months preceding treatment, 6; monthly average, $1\frac{1}{2}$. Total number of fits in five months during treatment, 3; monthly average, three-fifths. Average gain per cent, 60.

This patient gained 25 pounds (estimated) in weight; became well and active as is usual for men of his age, both in body and mind. Returned to Soldiers' Home at Leavenworth. During the last three months of his treatment he had but one fit.

Case 8.—C. M. Patient, 10 years of age; duration of epilepsy, five years; physical condition, good; perceptive and comparative faculties and memory impaired; unable to learn to read. Total fits four and one-half months previous to beginning of hydric treatment, January 11, 1898, 55; monthly average, $12\frac{1}{2}$. Total fits eight and one-half months during treatment, 64; monthly average, $7\frac{1}{2}$. Average gain per cent, 38.4. There has been a decrease in severity, as well as number of fits.

Case 9.—J. M. Patient 54 years of age; duration of fits, nineteen years; spare figure, thin in flesh and feeble in general health; has been intemperate, and intemperance is the assigned cause of his epilepsy. Has been very irritable and quarrelsome as the result of fits, and for this reason sent to the hospital from the Soldiers' Home, but this disposition has not been manifest of late. Is inclined to melancholy.

Hydric treatment began May 3, 1898. Number of fits for six months preceding treatment, 33; number of fits for three months during treatment, 16; average number per month before treatment, $5\frac{1}{2}$; average number per month during treatment, $5\frac{1}{2}$; percentage of gain, 3.3. The gain in general health and spirits has been distinct, and he has returned to Soldiers' Home.

Case 10.—J. T. S. Patient 53 years of age; duration of fits, fifteen years; cause, traumatism of skull, which first produced nervous excitability. Had as an aura vertigo and mental confusion. During last two or three years has had seizures only at night. Vertigo and confusional insanity have resulted from attacks recently. At the beginning of this record these attacks had resulted in extreme prostration of mind and body. Memory was practically abolished; speech was slow and hesitating; perceptive and comparative faculties correspondingly weakened; and he was confined to bed, being unable to walk unassisted. He was very thin, with general atrophy of muscles and weakness of heart. Treatment began April 4, 1898. In three months preceding treatment he had 22 fits; monthly average, $7\frac{1}{2}$. In three months during treatment he had 10 fits; monthly average, $3\frac{1}{2}$; gain per cent, $54\frac{1}{2}$. His general improvement was very marked in every way. He gained notably in flesh, strength, color, and animation, and had practically regained his normal mental tone when he was returned to the Soldiers' Home that he might be nearer to his friends. A letter from a Home official intimates that his health has again become impaired.

Case 11.—G. S. Patient 37 years of age; duration of fits, thirteen years. He is demented, irrational, and violent; silent and seeks solitude. Is anæmic and thin in flesh, with nervous, intense manner. Number of fits in three months preceding treatment, which began September 13, 1897, 60; monthly average, 20. Total fits in thirteen months during treatment, 165; monthly average, $12\frac{1}{2}$; average monthly gain per cent, 37.

There has been an equal or greater proportional gain in all mental and physical symptoms.

Case 12.—E. S. Patient 37 years of age; duration of epilepsy, twenty years. Convulsions in general very severe, with occasional petit-mal seizures, of which an accurate record was not made during first eight months of this record. Dementia marked, but not excessive; occasional visual hallucinations; flatulent dyspepsia, with enlarged liver and prominent abdomen; sleep disturbed and insufficient; poorly nourished; manner dull and languid. Treatment began October 12, 1896. During eight months preceding treatment he had 95 fits; monthly average, 11.9; during twenty-three months of treatment whole number of fits were 295, including all slight seizures; monthly average, 12.8; average loss per cent, 7.5.

There has been a marked gain in all respects, notwithstanding the apparent increase in number of fits. General health, flesh, color, sleep, and mental tone are all markedly improved. The attacks of grand-mal are much diminished in frequency and violence: it can not be accurately stated how much, on account of imperfection of record. The attacks of petit-mal are too slight to be noticed by any but the patient himself, are not attended by loss of consciousness, but are described by him as a brief "smothering sensation," and probably should be classed as a mere aura, not followed by seizure.

Tabular statement of the results of treatment in 12 cases of epilepsy by hydric methods.

Case No.	Years duration.	Average number of fits per month before treatment.	Average number of fits per month during treatment.	Average monthly gain per cent.	Duration of treatment in months.	General results.
1	25	4.67	0.8	80	5	Improvement, especially mentally.
2	15	15.5	1.3	12.9	10	General gain.
3	7	6.67	4.15	37.7	13	Marked gain in all respects.
4	14	5.5	3.16	39.3	6	Improved mental tone.
5	24	13	5.2	60	10	Marked improvement in every way.
6	36	11.4	9.8	14	5	Marked gain mentally and physically.
7	13	1.5	0.6	60	5	Great physical gain and complete mental recovery.
8	5	12.2	7.5	38.4	8	Less severity of fits.
9	19	5.5	5.3	3.3	3	Some mental and physical improvement.
10	15	7.3	3.3	54.9	9	Mental recovery; physical gain.
11	13	20	12.6	37	13	General improvement.
12	20	11.9	12.8	-----	23	Apparent loss of 7.5 per cent; general gain has been notable.

The average gain in the eleven cases in which the record is accurate is 39.8 per cent; the average duration of treatment, 7.4 months. In two of these cases, namely, cases 4 and 6, bromides had been administered for many months, and were not discontinued on beginning present treatment. The condition under bromides alone is contrasted with that under bromides with hydrotherapy added.

In none of the other cases have any disturbing elements capable of affecting results been introduced.

It is gratifying, upon looking up, so far as time would admit, what has been written upon the hydrotherapeutic treatment of epilepsy, to find such close corroboration of results which have been obtained here.

Fleury, in his classic work, "*Traité thérapeutique et critique d'hydrothérapie*," Paris, 1875, states the results of a considerable experience as follows: "We have not cured," he says, "the long standing severe epilepsies appearing to depend upon organic brain lesion, attended by profound modifications of sensibility and motility; but almost constantly in these desperate cases we have rendered the seizures less frequent and less severe. * * * We believe, however, that we have cured some epilepsies developed in youths or adults under the accidental influence of pathogenic causes more or less probable—errors of diet, abuse of alcoholic liquors, excessive coitus or onanism, intense emotion, etc. We do not affirm this (cure), because in cases of this kind the attacks ordinarily occur in the beginning, and often for several years, only at long intervals; and we have not been able to hold these patients under observation for a sufficiently long time to acquire absolute certainty." In conclusion he makes the following definite important statement: "Of all methods of treatment for epilepsy now known, hydrotherapy offers the most numerous and surest chances for success."

The statement of all the authors consulted agree with these conclusions of Fleury.

Weiss, Duval, and Delmas report cures. Becquiere, Frank, Rosenthal, Marcet, Nothnagel, and Bottey, all commend the treatment in terms similar to those quoted above.

P. Bricon, in his doctor's thesis upon the treatment of epilepsy, gives the details of a systematic employment of this treatment at the Bicetre, 1876-1881, in the service of M. Bourneville. An examination of the cases show that the treatment was usually continued for about two months without cessation; sometimes it was repeated; and in one case extended over five months.

Of 48 cases detailed, 34 showed improvement. In 17 of the latter there was no other treatment; and in 10 of these the improvement was very marked.

Our experience would seem to indicate that, in long standing cases, improvement is less marked in the first two or three months than it is later. After a certain gain is made improvement becomes more rapid. It therefore seems quite probable that the average treatment at the Bicetre was too short for the best results.

Another important advantage from the use of hydrotherapy in epilepsy is mentioned by both Fleury and Bottey, namely, in admitting of the use of bromides in large doses, with an important lessening of its ill effects, physical and mental. This is accomplished in two ways: By facilitating and regulating the absorption of the drug it permits us to obtain the same effects from somewhat smaller doses; while on the other hand, by its stimulating and tonic effects upon the organism, as well as by its favorable action upon the elimination of the bromide salt, it incontestably increases tolerance of the drug, and combats its ill effects.

OF GENERAL PARALYSIS.

The following cases have been brought under treatment since the publication of the last report:

Case 1.—W. K., jr. Duration before treatment, seven years; rapid progress during year preceding treatment; maniacal excitement and apoplectic seizures characterizing the progress; bedridden; third stage of disease well established.

Treatment began November 26, 1897. Present condition almost complete restoration of normal physical condition. Physical symptoms are nervous manner and slight parietic speech, characteristic when excited. Mentally there is some dementia; moderate emotional weakness. He employs his time constantly in sketching in pencil and oils, attends church outside, and sings in the choir, visits the city unattended to dispose of his pictures, etc. Has suffered from malarial paroxysms, with temporary aggravation of nervous symptoms mentioned above.

Case 2.—J. E. T. Disease had continued about one year before treatment. One apoplectic seizure had occurred. Parietic weakness was marked; assistance required to stand; mind, lethargic; attention aroused with difficulty; bowels and bladder evacuated unconsciously; specific history probable, but not definitely established; no active delusions; inequality of pupils at times; marked reduction of flesh, and muscular atrophy. Present condition: Has gained 30 pounds (estimated); is about the ward and grounds on parole, walks steadily, and has almost complete control of bladder and rectum.

Mentally he shows moderate dementia, and is rather slow in mental action; reads papers and magazines with some apparent appreciation; converses rationally and shows fair judgment upon ordinary affairs, though somewhat slow in expressing himself. Treatment began March 3, 1898.

Case 3.—N. L. R. Duration before treatment, two years. Motor impairment of speech noted a year or more before mental failure was recognized by friends. Tremors, parietic weakness, inequality of pupils, and almost total motor aphasia, with shifting delusions of grandeur, and emotional disturbances characterized the case on admission. The disease was rapidly progressive. Specific history. Treatment was begun October 6, 1897.

The result of treatment was to arrest progress, and hold the case about stationary for nine months, with recovery from delusions and some fluctuations in various symptoms. In the last two and one-half months he has suffered repeatedly from malaria, with direct and immediate bad results upon brain disorder, resulting in an attack resembling apoplexy, but without loss of consciousness or actual paralysis, but with marked increase of parietic weakness. He is now again improving slowly.

Case 4.—W. C. S. Duration before treatment, two and a half years; characterized by excitement, emotionality, impulsive violence, unequal pupils, and characteristic delusions of grandeur. Has led a very fast life. Disease near the dividing line of second and third stages; parietic weakness and atrophy of tissues moderate; mind incoherent.

Treatment began September 30, 1897. Present condition, improved mentally and physically; has notably gained in flesh, strength, color, and expression. Is less emotional; somewhat less delusional; some gain in coherency. Is decidedly more



ST. ELIZABETH—SPRAY BATH.

amenable to law and order, and is much more comfortable. There have been exacerbations in this case coincident with malarial attacks.

Case 5.—T. H. A. Duration of disease previous to treatment, six months. Characteristic delusions of grandeur, tremors and pupil symptoms; emotional; destructive; noisy; untidy; well nourished.

Treatment began September 23, 1897. The result in the first six months was a notable improvement in most respects. He became orderly, fairly neat, free from violence and excessive emotionality, helpful about ward work, and enjoyed a parole of the grounds. His mind became coherent, but delusions of grandeur remained; and, as he became otherwise more normal, he grew more fond of expressing these delusions in an exuberant flow of language. He made himself very entertaining to visitors, with such evident enjoyment of his own power of entertaining that it became extremely difficult to tell how much sprang from delusions and how much from conscious exercise of the imagination. At the end of eight months he ceased to express these delusions, and seemed to be progressing steadily toward recovery. His mental condition closely resembled that of the earliest stage of senility, when the first failure of acuteness becomes noticeable to intimate associates, and was associated with a slightly garrulous tendency. Physically, he showed absolutely no symptoms of brain disorder, being stout and ruddy, without tremors or any coordinative failure. Then ensued malarial attacks, distinctly intermittent at first; afterwards the toxæmia announced itself by slight daily rise of temperature in the afternoon. The mental tone became progressively impaired, as did the physical condition; the culmination being reached, five days prior to present writing, in a succession of general epileptiform seizures, followed by temporary aphasia.

Case 6.—W. J. W. Duration before treatment, three years. This case has been characterized in its early history by headache, vertigo, and progressive dementia and paresis. His symptoms, prior to admission, led to the diagnosis of cerebral tumor—incorrectly, as it would now seem. He has no headache or any form of monoplegia, and no distinct symptoms of tumor since he has been a patient here; while he has tremors, ataxic symptoms, pupillary inequality, the most characteristic delusions of grandeur, characteristic speech, and all the symptoms which form the tout ensemble of typical paresis.

Treatment began April 16, 1898. There was marked improvement in physical and moderate improvement in mental symptoms until the appearance of malarial attacks. The latter have been repeated, with strong tendency to assume chronic form. In the intervals of freedom he promptly gains, to lose ground again upon recurrence of fever. At present he remains slightly improved.

Case 7.—W. T. Duration before treatment, ten months. This case is characterized by great excitement and restless, noisy activity. He had been under treatment at another hospital; and friends stated, on his admission, that the prognosis there given contemplated the possibility, at least, of an early fatal termination by exhaustion. It seemed to us that there might be ground for such an opinion, unless rest and sleep could be secured, waste checked, and nutrition improved.

May 16, 1898, he was placed under treatment by restraint in bed, full feeding, massage, cold wet-pack, etc. Increased sleep has been secured, appetite developed, and the rapid progress of the disease checked. There is a little gain in self-control and in muscular coordination. I think we should be justified in saying that advance of disease has been checked, and a stationary condition maintained. Has gained 9 pounds in last three weeks.

Case 8.—F. M. Duration before treatment, eight months; specific history nine years back; condition thin, feeble, ataxic; sight lost in right eye, and much impaired in left, through atrophic changes; convergent strabismus of right eye, more marked at times. Mental condition characteristic of early stages—extravagantly buoyant, self-confident, full of great plans, while utterly regardless of lack of means to carry them out. Impulsive, emotional, subject to violent outbreaks. He had experienced skillful treatment before admission, including iodides, which were not well tolerated. Treatment began February 16, 1898.

Rest in bed, overfeeding, and massage, as well as hydrotherapy, were used. His mind now seems normal. He has improved physically in every way—weight, color, strength, coordination. His manner is quiet and self-contained. Oculist states arrest of retinal degeneration. Condition seemed jeopardized at one time by malaria, but it is hoped that crisis is past.

Case 9.—W. M. This case is yet in the earliest stage. Treatment began September 3, 1898. While the case already, after twenty-five days, shows distinct improvement, it would be premature to make any special account of this, or even speculate regarding its permanence. The case is only mentioned to bring it into line for subsequent report.

Case 10.—P. H. This case is recent. Treatment began August 24, 1898. Patient is in an acute maniacal state, with shifting delusions of grandeur; unequal pupils;

intense emotional state, etc., and specific history. It is probably a case of paresis, but it is too early to report results of treatment, other than immediate calnative effects. Like the preceding case, this will be a subject of future report.

Case 11.—G. M. General paralysis; duration at beginning of treatment, five years; specific history. At beginning of treatment was confined to bed by reason of paretic weakness and loss of coordination; tremors and jerking movements marked; very "nervous;" could not move from bed to chair beside it without assistance; untidy; motor aphasia nearly absolute; atrophy of tissues very marked. A most unpromising case for treatment to all appearance.

Treatment began August 26, 1897, with cold wet-pack, cold douche, and massage. At present time he is strong, steady, and confident in his movements, ruddy in color, has gained many pounds in weight, speaks without tremor, and is very useful as a ward assistant. The delusions of grandeur, which marked his disease as long as he was able to express them, are absent. It is a marked instance of restoration of motor neurons, which appeared hopelessly degenerate.

Case 12.—W. T. N. Duration of disease before treatment, seven years. This case was well advanced in third stage of paresis, he having been confined to bed for four years.

Treatment was undertaken in this case, and the two following, that all might be included in the experiment, without anticipating any marked results. Treatment began August 27, 1897. The result has been slight gain in general condition.

Case 13, E. H. M., and *Case 14,* F. E.—These are cases of advanced disease, with vesical and renal complications. Treatment began May 31, 1898, and condition remains practically unchanged.

Tabular statement of the preceding cases.

Name.	Duration of disease prior to treatment.	Duration of treatment.	Result of treatment.	Present status.	Remarks.
W. K., jr.	7 years....	10 months.	Arrest of disease.	In hospital..	Moderate dementia and emotionality remain.
J. E. T.	1 year....	7 months.	.....do.....	.....do.....	Slow mental action.
N. L. R.	2 years....	11 months.	Failure.....	.....do.....	Aggravated by malarial toxæmia.
W. C. S.	2½ years....	1 year....	Improvement.....	.....do.....	Do.
T. H. A.	6 months....	.....do.....	Improvement followed by failure.	.....do.....	Do.
W. J. W.	3 years....	3 months.	.....do.....	.....do.....	Do.
W. T.	10 months.	4 months.	Remains same.	.....do.....	Rapid progress arrested; has gained 9 pounds in three weeks.
F. M.	8 months.	7 months.	Arrest of disease.	.....do.....	Progress retarded by malaria.
W. M.	2 months.	3 weeks.	Improved.....	.....do.....	Too early for decisive results.
P. H.	1 month....	.....do.....	Not decisive.	.....do.....	Do.
G. M.	5 years....	1 year.	Marked improvement.	.....do.....	Arrest of disease up to present time; steady gain; useful on ward.
W. T. N.	7 years....	.....do.....	Slight improvement.	.....do.....	More than maintains condition of one year ago.
E. H. M.	2½ years....	3 months.	Remains same.	.....do.....	Vesical and renal complications.
F. E.	2 years....	.....do.....	.....do.....	.....do.....	Do.

The following tabulation shows the subsequent progress of cases of paresis tabulated in report of 1897:

Name.	Duration before treatment.	Result of treatment.	Present status.	Remarks.	Further history to September, 1898.
J. P. G.	Over 1 year.	No improvement.	In hospital.	6 months' treatment.	Condition about same; has improved in last six months.
A. S. McN. ...	2 years...	Some improvement.	.....do.....	Third stage of paresis.	Has suffered from malaria, but about holds his own.
J. K. M.	2½ years.	Marked improvement.	.....do.....	Treatment continued.	Slight improvement, notwithstanding attacked by malaria.
P. D.	Over 2 years.	.....do.....	.....do.....	Failing, Aug., 1897.	Failure arrested; practically same as last year.
R. M. ....	.....do.....	.....do.....	.....do.....	Continued treatment.	Remains much improved.
J. B. McD.	1½ years.	Complete arrest.	Discharged	Plays in orchestra.	Remains well after more than three years
P. B. M. α ...	2 months	.....do.....	In hospital.	.....	Malarial paroxysms recurrent, and assuming chronic form, have caused renewal of mental disease since January, 1898, with gradual failure of memory and comparative faculty. No delusions. Full doses of quinine cause temporary hallucinations and delusions. Is now again improving.

α An apoplectic seizure, with left hemiplegia, coincident with malarial attack, has just occurred at time of finishing this report.

It is especially noteworthy that, of the cases detailed, malarial complications have occurred in 6, namely, cases 1, 3, 5, 6, 7, and 8, with immediate and serious consequences. In 9 other cases, making 15 out of 20 cases now under treatment, malaria has entered as an element, more or less seriously modifying the progress of the case. It should be stated parenthetically that great care has been taken in the diagnosis of malarial complications, blood examinations demonstrating the presence of malarial parasites in each case.

Such association of malarial infection with paresis, and with other forms of organic brain disease, is of great practical interest, in both its etiological and pathological aspects.

While it can not well be ignored in the discussion of these cases, I shall but briefly refer to one or two practical points:

First, the occurrence of the infection in so large a proportion of these cases * may well suggest a predisposition to it in paresis, owing to diminished power of resistance in the organism; which would accord with the well-known effects of cerebral disease upon the nutritive functions.

Second, the action of the malarial toxins appears to be greatly exaggerated in many cases of organic brain disease. Among our patients of this class the pernicious cerebral form of disease occurs with a frequency out of all proportion to its occurrence among the sane in this locality; at least it is attended by the usual symptoms of coma and quick fatality, attended by venous engorgement and oedema of the entire brain tissue.

Without discussing the comparative agency of toxins or emboli of parasites, the frequency of these cases in our population seems to clearly indicate that organic brain disease predisposes to this pernicious malarial type.

In paresis we have, as prominent pathological features (concomitant with cell degeneration) degenerating vessels, proliferating nuclei engorging the perivascular and pericellular lymph spaces, and venous engorgement. Thus certain prominent pathological changes are practically identical in the two forms of disease, and their concurrence might naturally be expected to exaggerate the destructive changes which are common to both. This is, as a matter of fact, what seems to take place, whether their action is paroxysmal or gradual.

Notwithstanding this complication, a summary of the cases just described shows some positive results:

Out of 21 cases reported the disease has been completely arrested, for the time at least, in 6. One of these, J. B. McD., has now remained well for over three years;

*Our records show the occurrence of malarial disease in about 40 per cent of our general population.

one, R. M., for more than two years; two, W. K., jr., and G. M., have steadily gained for ten months and one year, respectively, and have been free from all mental manifestations of the disease for at least six months.

F. M. has improved steadily, except when suffering from malaria, for seven months; the last four months remaining free from any characteristic symptoms of the disease.

J. E. T. has steadily improved for seven months, and is still gaining in mental tone. Three only are in worse condition than at beginning of treatment.

P. B. M., reported a year ago among the arrests, suffered a return through malarial poisoning. Two others are decidedly improved after one and two years' treatment. Nine having undergone improvements and losses by turn, remain about as they were a year ago, or, at beginning of treatment, when this has continued less than a year.

Considered from the point of view of the present actual tendency of each case, five only are showing the characteristic progress of the disease, all of whom have suffered from malaria, four of them still showing the active manifestations of malarial disease.

If this test were applied to any point of time during the past winter and early summer, when malaria least prevails, not more than three cases would be found pursuing the ordinary course of the disease; nor would any case be found not included in the five mentioned as showing downward progress at the present time.

Is it likely that such a showing could be made in any 21 untreated cases, taken at all stages of the disease? Under like circumstances, can six arrests at one time, with a duration extending from four months to three years, be shown? If not, some value must be conceded to this treatment.

It should be fully understood that reliance is not placed upon hydrotherapy alone in the treatment of these cases. On the contrary, every available means that holds out the promise of benefit to the individual case is strenuously employed. It is only claimed for hydrotherapy that it is the chief remedy; that in some form it is applicable and of benefit to all, and that without its aid the other measures employed could not have produced equally favorable results.

We should also have in mind some standard for gauging results, which will vary with different cases depending upon the stage of the disease, and especially upon the time during which degenerative changes have progressed.

If we could examine the brain of any paretic in whom the disease had existed, say from three to five years, we should undoubtedly find marked sclerotic and atrophic changes, the attendants upon cell degeneration. If the disease should be permanently arrested in any such case, there must remain more or less permanent loss of cerebral function; that is, there will be more or less secondary dementia, which will be permanent; as is true of any form of chronic insanity which has been, as we say, "cured."

In the case of J. B. McD., with a duration of one and one-half years, the permanent loss is scarcely appreciable. In that of W. K., jr., of seven years' duration, the limit of improvement has probably been nearly reached. In G. M., five years' duration, improvement has already exceeded what one would expect, and still it slowly continues. In F. M. the period of disease was short, and but little residual impairment is now noticeable.

If either or all these arrests should prove to be permanent, and the term "cured" applied to it, the term would evidently have a somewhat different value in each case. Whatever the term used, it can only mean arrest, with regeneration of such neurons as have not reached the point of hopeless degeneration.

In addition to the cell degeneration there remain also vascular changes which are permanent, and, according to their degree, a source of danger in arrested cases, should conditions arise involving either toxic or congestive strain.

In describing these cases of epilepsy and paresis I have avoided minuteness of detail, lest it should become too tedious. It is hoped that sufficient salient points have been stated to subserve the desired purpose of comparison, in order to estimate the results of treatment.

Very respectfully,

G. W. FOSTER,
Assistant Physician.

DR. W. W. GODDING,
Superintendent.

REPORT
OF THE
ARCHITECT OF THE UNITED STATES CAPITOL.

OFFICE OF THE ARCHITECT OF THE
UNITED STATES CAPITOL,
Washington, D. C., July 1, 1898.

SIR: I have the honor to submit the following report on the progress of the various works under the control of this office, together with a statement of expenditures by your Department for the same, during the fiscal year ended June 30, 1898:

THE CAPITOL.

The crypt in the central portion of the building has been restored to its original condition, as provided for in the deficiency bill approved July 19, 1897, by taking out the walls forming rooms, erected therein for the accommodation of the Library of Congress. This work involved repairs to the side walls and ceilings and painting and lighting for the same.

The renovation, painting, and decoration of corridors has been continued during the past fiscal year. Following the plan adopted and mentioned in my last report, this work has been done in light and pleasing tints. The principal corridors at the north of the Hall of Representatives and those around the Senate Chamber have been painted and decorated. This work includes the connecting corridors between the old and new portions of the building in each wing.

To decorate these corridors required the thorough cleaning of the ceilings, which have much ornamentation in plaster, relieving them of the old fresco coatings and treating them to receive the new tints. The restoration of a condition suitable to receive the new work has been somewhat troublesome on account of frequent repairs in the past and conditions incident to long service. Their present state has justified the expenditures made, and while their treatment in colors is of a simple character, the effects are pleasing. This work involved the erection of considerable scaffolding. It is proposed to continue the work in other portions of the Capitol during the coming season.

During the past year the work of scraping and painting the exterior surface of the Dome and walls of the old portion of the Capitol was started, and continued until interrupted by the winter season. On the Dome much work was necessary on account of the scaling of the old paint work, causing the exposure of the iron structure in many places. All such places were first thoroughly scraped and leaded before painting. Overlapping sections and seams were recalked and made watertight. At the close of the work season the painting of the Dome had

been extended to the colonnade. The east front of the old building had been painted as far as the central portico, including the passage under the steps. The west front of the old building had been painted as far as the return walls. The ceilings of both porticoes received extensive repairs.

In the interior of the Capitol a number of committee rooms have been remodeled. The room of the Senate Committee on Public Buildings and Grounds has been extended, under order of the Senate Committee on Rules, by taking out of the entry room a wooden partition forming a room for the Senate Committee on Epidemic Diseases. The room thus vacated was added to the room of the first-named committee. This work included the rearrangement of the heating facilities, removal of the washstand, repairs to walls, and the painting of the room.

The room of the Senate Committee on Public Lands has received repairs to the flooring and plumbing, and the decorated walls and ceilings have been retouched.

Changes have been made in the plumbing of the room of the Senate Committee on Finance, and the walls and ceilings repaired and painted.

The wash basin in the Senate post-office has been removed, to make way for a telegraph booth to be located there.

The room of the Senate Committee on Pensions has been remodeled by removing the washstand to an adjoining recess, painting the walls and frescoing the ceiling. The heating facilities in this room have been rearranged.

The office of the superintendent of the House folding room has been supplied with a metal ceiling and the room painted.

The room of the House Committee on Elections No. 3 has been supplied with new water and steam heating arrangements.

The heating, lighting, ventilating, and elevator machinery throughout the entire building has been overhauled and put in order. The tank supply in the attic of each wing has been increased by running additional mains thereto from the subbasement and by overhauling supply mains already in position.

A number of committee rooms in the House wing have been provided with increased water supply by the rearrangement of supply pipes leading from the tanks in the attic. In three of the rooms on the House side stationary marble washstands have taken the place of portable stands.

In the old building several of the rooms have received new and more efficient fireplaces, provided by reconstructing the old, including the outlets at the roof.

The kitchens connected with the House and Senate restaurants have been overhauled in sewerage, cooking ranges, steam and water connections, and everything necessary to render them serviceable and cleanly.

The repairs to the plumbing of the building, which includes a large number of closets, public and private, has been kept up during the year. This work requires daily attention, which has been given.

The ventilation of the public closets of the House and Senate has been much improved by installing in each an exhaust fan, driven by electric motor, and connecting these with flues leading to the roof.

Repairs have been made to the terrace roof, which is soon to be replaced by a new one; and pointing up of the stonework has been done.

The large skylights of the House, Senate, central building, and Supreme Court, as well as the copper roof of the building, have been repaired where necessary. A considerable sum is expended in this

work annually, owing to the great area of the roof of the building and dome. A skylight has been placed in the roof of the terrace over the Senate dynamo room.

New doors of maple have been provided for the entrances to the gallery of the Senate Chamber, and doors of mahogany for the entrances to the Secretary's office of the Senate.

Bulkheads and sash have been removed from various corridor intersections in the old building, resulting in better ventilation.

A nickel hand rail has been provided for the western stairway leading to the Hall of Representatives.

The additional cases and shelving for the law library mentioned in my last report have been completed.

General repairs, such as providing window screens, repairing windows, doors, walls, fireplaces, heating registers, and tiled floors, have been made to committee rooms throughout the building. A number of these rooms not otherwise mentioned have been painted. These are set forth in the appendix.

WORKS OF ART.

During the past fiscal year there have been received from the State of Missouri statues of Thomas H. Benton and Frank Preston Blair. The State of West Virginia has presented a statue of John E. Kenna. The three statues are the work of Alexander Doyle, sculptor. They were received and placed in Statuary Hall December 3, 1897.

A bust of John Tyler has been received and placed in one of the niches in the east vestibule leading to the Senate Chamber.

Under the direction of Mr. W. H. Duckstein, the statues in the Capitol have been cleaned, and several of the paintings and portraits in oil have been restored.

ELEVATOR, SENATE WING.

In accordance with the provision in the deficiency bill approved July 19, 1897, a new elevator has been placed in the western elevator shaft of the Senate wing. This work included new operating machinery, consisting of an electric motor directly connected to the driving worm of the drum gear, a switch board for the complete control of the motor and its speed, and numerous safety and other devices. Also a new elevator car and inclosures for three floors, all of handsome pattern. This elevator was installed under contract with the Sprague Electric Company, of New York. Its operation has given entire satisfaction. The elevator at the south end of the east corridor of the Senate wing has been repaired.

SPECIAL REPAIRS, HOUSE.

A new steam boiler has been placed in position in the House boiler room. This boiler, secured to increase the steam power of the electric-lighting machinery, is of the finest construction and material suitable for extreme service and high steam pressure. It is constructed almost entirely of forged steel, and was furnished under contract with the Babcock & Wilcox Company.

In connection with this work, an expansion steam joint connection was made with a companion boiler to secure cooperation. The steam piping running from these boilers to the dynamo engines and the exhaust steam work has been entirely reconstructed, the steam supply pipe being much enlarged and extended to provide for future requirements.

New steam pumps have been erected to insure ample water supply to the steam boilers. In addition to this, and for the same purpose, a new 6-inch water main has been erected, running through the terrace, connecting with a 12-inch supply main near the north terrace.

The boiler flue running from the electric-lighting boilers to the main stack has been reconstructed and enlarged to meet the requirements of the new boiler.

STEAM HEATING AND MACHINERY, SENATE.

Under this head the chief engineer of the Senate reports special repairs. The boiler furnaces were reconstructed and new bearing and grate bars placed in position. A special duplex boiler feed pump has been provided and connected to the boiler supply. Eleven steam engines and six steam pumps were repaired, and several of the steam heating coils have been rearranged.

The main air ducts were cemented to maintain the purity of the air and to prevent access of moisture.

A number of special operating tools for the steam and ventilating machinery have been procured.

CAPITOL GROUNDS.

The work on the grounds during the past fiscal year has been such as would improve the grounds by restoring those portions where shrubbery has been removed and by the treatment of the lawns adjoining the building at the north and south. These latter were given a top dressing of compost. The remaining shrubbery, trees, and walks have been kept in good condition, and considerable repairs made to artificial stone pavements and walls.

The roadways in the eastern portion of the grounds, excepting East Capitol street, have been paved with asphalt. This work was done by the Cranford Paving Company of this city. The East Capitol street entrance will be paved during the month of July next, an arrangement to this effect having been already entered into.

The sum of \$12,000, appropriated for the fiscal year 1899 for the care and maintenance of the Capitol grounds, is not sufficient for keeping these grounds in a condition befitting their natural beauty and character. The vast expanse of lawn, the area of the walks and roads, demands more care than can be provided out of the sum appropriated. Pavements, roadways, and stone walls and curbing require constant and skilled attention, and if these features and the lawns are to be kept in proper condition it is necessary that sufficient funds be provided.

LIGHTING CAPITOL AND GROUNDS.

The lighting by electricity of the Capitol and grounds has been continued during the past year with satisfactory results. No interruption has occurred in this service, notwithstanding the heavy demands made on the machinery at certain periods during the session. Since the installation of the plant, power has been furnished for running the ventilating and other motors in the building and that required for the elevator. These demands have at times called for the capacity of the plant, yet at no time has the machinery failed to supply the required current.

The service has been greatly increased by extension to various committee and other rooms. These extensions have been made during the past fiscal year out of the regular appropriation for lighting. The effi-

ciency of the plant has been greatly increased by connecting the sections in the House and Senate dynamo rooms, so that in case of a large required output the entire machinery may operate as one unit. This was effected by running a duct across the courtyard between the terrace and building and installing therein suitable feeders and equalizer cables. These end in suitable connections on the switch boards in the two distributing rooms. This work included the restoration of the pavement in the courtyard and the installation of suitable instruments on the two switch boards.

In the appendix will be found data concerning the operation and extension of the plant.

HOUSE AND SENATE STABLES AND ENGINE HOUSE.

The stalls and roof of the House stable has received repairs and new water supply and connections put in. The outlets, street washers, and sewers have been repaired.

A new floor has been laid at the Senate engine house and some repairs made to the cornice, windows, and stalls. The interior of the upper story has been thoroughly painted. This includes the sleeping room, club room, and bathing rooms. The carriage shed of the Senate stable has been roofed anew, and incidental repairs made to the stalls, wagon sheds, and exterior portions of the buildings.

COURT-HOUSE, WASHINGTON, D. C.

Sundry repairs have been made to this building during the past year. The steam heating and ventilating plant and the plumbing and sewerage throughout the building have been overhauled; the copper roof and down spouts of the building repaired wherever leaks have been found. The condition of this roof is unsatisfactory, requiring frequent repairs, and should be replaced by a new roof with proper down spouting.

A skylight has been placed in the ceiling of the west hall.

In the marshal's office the mantel has been removed and the fireplace walled up and railing shifted, for clerical accommodation. Walls of this room have been painted. In the stationery room of this office additional shelving has been provided.

A new doorway has been constructed in the district attorney's room and the room painted.

Ventilators have been provided in the ceiling of the equity court.

A temporary floor has been constructed in criminal court room No. 2.

Iron grating and wire screens have been provided for some of the cells.

Miscellaneous repairs have been made to the portico and windows and doorways in the building.

In my judgment the sum appropriated for the annual repairs to the court house is inadequate. If the proposed erection of the municipal hall is to be long delayed, at least \$3,000 should be appropriated for repairs to the building during the coming fiscal year.

BOTANIC GARDEN.

The sash forming the roof of the west octagonal of main conservatory were removed, the iron frames thoroughly scraped and given four coats of paint, sash bars put in, and the east portion of the roof glazed with first-quality double thick glass; the south, west, and north sides were

glazed with first-quality double-thick glass. This house was thoroughly scraped and given two coats of paint inside and out.

The west parallelogram was also given two coats of paint outside. The iron frame of rotunda was thoroughly scraped and the entire outside given two coats of paint.

The sash forming roof of the east parallelogram of main conservatory were removed; the iron frames were thoroughly scraped and given four coats of paint, sash bars put in, and the south portion of roof glazed with polished plate glass. This portion of the house was given one coat of paint on the outside and inside.

Heating apparatus to main conservatory was thoroughly overhauled and put in good condition. The hot-water pipes in east parallelogram were taken down and lines straightened. Two flow and two return 2-inch steam pipes were attached to auxiliary steam boiler under rotunda and south side of each parallelogram, which have not only been a saving in fuel, but of great benefit to the plants in these two houses. Three-fourths inch galvanized iron pipes were purchased and laid overground along either side of center walks, and stopcocks placed in same every 50 feet to facilitate watering the line of plants along either side of this walk. All the plant and propagating houses were repaired and reglazed, and the necessary repairs to staging were made.

The woodwork of superintendent's lodge and office building was given a coat of paint. The necessary repairs to concrete walks south of main conservatory were made.

The water supply in main conservatory and plant houses has been renewed and new stopcocks put in where necessary.

An additional wagon and cart shed was erected on south side of Maryland avenue, and a new tin roof put on same, the old shed repaired, and floor put in same for storing mowing machines, roller, etc. The rose and propagating houses south side Maryland avenue were painted outside and in with two coats of paint. A new propagating bench of iron construction was put in.

The sash of plant house No. 2 were removed from east side and new rafters and purlins of iron put in and sash bars put in and glazed. The seven houses south of Maryland avenue have been repaired, painted, and reglazed where necessary, and all needed repairs and new staging made and erected in three of these.

A hot-water tank of 160 gallons has been placed in the west end of storehouse south side of Maryland avenue, and a 2-inch flow and return connects it to the hot-water boiler erected last year.

EXPENDITURES.

ANNUAL REPAIRS.

Pay rolls, mechanics, laborers, etc.....	\$21, 137. 76
Labor paid by voucher.....	394. 68
Machinery, iron, etc.....	274. 28
Brushes, sponges, etc.....	657. 74
Lumber and mill work.....	774. 55
Hardware.....	419. 22
Steam fittings, etc.....	892. 33
Lime, sand, and cement.....	213. 25
Paint, lead, glass, and oil.....	2, 324. 86
Stone and marble work.....	76. 10
Silver and nickel plating.....	19. 60
Grate bars, etc.....	305. 75
Drawing material and blue prints.....	68. 97
Electric bells and wiring.....	260. 10

Forage and harness.....	\$201.50
Repairs to elevators.....	55.10
Hauling, expressage, etc.....	51.18
Repairs to kitchen ranges.....	14.75
Fuel.....	47.37
Steam fitting, Supreme Court.....	276.80
Care and repair of clocks.....	75.00
Repairing roof and tin work.....	287.80
Painting and decorating.....	834.23
Rope tackle, etc.....	44.55
Steam packing and pipe covering.....	194.04
Miscellaneous.....	98.49
Total	30,000.00
Appropriated June 4, 1897.....	30,000.00

CAPITOL GROUNDS.

Pay rolls, gardeners, laborers, etc.....	10,726.38
Labor paid by voucher.....	107.48
Plants and seeds.....	187.45
Fertilizers and soil.....	391.50
Sodding.....	28.80
Tools and implements.....	41.90
Brooms and brushes.....	75.00
Moving shelter house, Washington.....	70.00
Fuel for shops and conservatory.....	64.05
Lime and cement.....	23.00
Plumbing material.....	123.23
Hardware.....	16.39
Painting lamp-posts, etc.....	48.00
Expressage.....	80.11
Paints and oil.....	4.00
Miscellaneous.....	12.71
Total	12,000.00
Appropriated June 4, 1897.....	12,000.00

LIGHTING CAPITOL GROUNDS, ETC.

Gas service from July 1 to November 30, 1897, inclusive.....	1,811.20
Pay rolls, electricians, engineers, firemen, lamplighters, etc.....	20,115.45
Labor paid by voucher.....	68.30
People's Gas Saving Company.....	45.00
Electric, incandescent, and arc lamps.....	955.36
Wire and other material.....	2,237.33
Gas and electric fixtures.....	978.87
Iron and metal work.....	462.30
Expressage and hauling.....	54.76
Hardware.....	8.20
Miscellaneous.....	22.74
J. P. Hall for electrical construction.....	1,412.37
Total	28,171.88
Appropriated June 4, 1897.....	\$24,000.00
Appropriated July 7, 1898.....	4,171.88
Total	28,171.88
Gas service for January, February, March, April, and June, 1897.....	3,419.20
Appropriated July 7, 1898.....	3,419.20

ELEVATOR, SENATE.

Pay rolls, mechanics, laborers, etc.....	893.89
Labor paid by voucher.....	93.40
Iron and metal work.....	270.00
Metal ceiling and sides to shaft.....	184.20
Blue prints, etc.....	21.47

Mortar, sand, and cement.....	\$50.50
Rubber tiling	84.00
Wire and electrical connections	268.60
Pipe and fittings.....	24.16
Expressage and telegrams.....	5.31
Lumber.....	15.60
Miscellaneous.....	13.87
Sprague Electric Elevator Company.....	4,575.00
Total	6,500.00
Appropriated June 19, 1897.....	6,500.00

SPECIAL REPAIRS, HOUSE.

Pay rolls, mechanics, laborers, etc.....	2,100.74
Labor paid by voucher.....	81.60
Iron work and plates.....	745.90
Mortar, cement, and sand.....	73.65
Expressage and telegrams.....	9.01
Blue prints, etc.....	21.27
Miscellaneous.....	36.23
Wallace Stebbins, steam-pipe fitting, etc.....	1,181.60
Babcock & Wilcox, for boiler.....	4,250.00
Total	8,500.00
Appropriated June 4, 1897.....	8,500.00

STEAM HEATING AND MACHINERY, SENATE.

Pay rolls, mechanics, laborers, etc.....	802.63
Machinery, iron, and metal work	357.44
Cement, brick, lime, and sand.....	164.10
Hardware.....	287.65
Hose and packing.....	67.12
Hauling and expressage.....	9.28
Paints, oil, etc.....	30.30
Grate bars.....	159.13
Plumbing and steam-fitting material	456.20
Bell and bell wiring, etc.....	292.70
Repairs to elevator.....	161.00
Fire bricks and clay.....	42.21
Water coolers.....	250.00
Repairs to steam pump.....	40.00
Oil cans.....	16.00
Reserved for bills.....	29.24
Total	3,165.00
Appropriated June 4, 1897.....	3,165.00

VENTILATION, SENATE.

Pay rolls, mechanics, laborers, etc.....	176.50
Labor paid by voucher.....	18.00
House for laboratory.....	555.45
S. H. Woodbridge, compensation	481.67
Expressage and telegrams.....	48.47
Lumber.....	62.81
Apparatus.....	553.41
Hardware.....	8.96
Pipe and fittings.....	32.47
Fans and motor wiring.....	1,537.27
Miscellaneous.....	34.46
Total	3,509.47
Balance reserved	1,301.59

ADDITIONAL CASES, LAW LIBRARY.

Pay rolls, mechanics, laborers, etc.....	\$200.00
Lumber	143.04
Iron work	42.33
Painting.....	9.00
Hardware	4.97
Miscellaneous.....	.66
Total.....	400.00
Appropriated June 4, 1897.....	400.00

FLAGS FOR CAPITOL.

Flags and repairing same.....	97.75
Unexpended balance.....	2.25
Total.....	100.00
Appropriated June 4, 1897.....	100.00

PAVEMENT, CAPITOL GROUNDS.

For grading and resetting curb.....	955.80
Labor paid by voucher.....	9.50
Cranford Paving Company	9,693.52
Total	10,658.82
Balance unexpended	3,341.18
	14,000.00
Appropriated June 19, 1897.....	14,000.00

ENGINE HOUSE, SENATE AND HOUSE STABLES.

Pay rolls, mechanics, laborers, etc	137.50
Labor paid by voucher.....	29.00
Painting and kalsomining.....	88.00
Lumber.....	234.93
Hardware	9.75
Miscellaneous.....	.82
Total	500.00
Appropriated June 4, 1897.....	500.00

APPENDIX.

[Items connected with the work not set forth in report.]

COMMITTEE ROOMS PAINTED OR FRESCOED.

HOUSE WING.

Foreign Affairs (partially).	Railways and Canals.
Militia.	Expenses Interior Department.
Accounts.	Printing (partially).
Post-Offices and Post-Roads (partially).	Invalid Pensions.
Judiciary (painted and ceiling frescoed).	Revision of Laws.

OTHER ROOMS IN HOUSE WING PAINTED.

House restaurant.	Superintendent Document Room.
Chief Clerk's room.	House post-office.
Office rooms, Clerk of House.	File clerk (files rooms).
Hall of columns, basement floor.	House library.

Walls of inner courts, west side.

SENATE WING.

Room of Vice-President (painted and frescoed).	Private Land Claims (frescoes repaired).
Public lands (frescoes repaired).	Education and Labor.
	Library.

SENATE WING, OTHER ROOMS, ETC.

Office of Capitol police.	The Supreme Court room.
Hall running to east elevator.	Judges' conference room.

Window frames, doorways, etc., throughout the building.

ELECTRIC LIGHTING EXTENSION PAST FISCAL YEAR.

[16-candle power lamps.]

The crypt	16	House kitchen	4
Gallery floor, corridors	88	House restaurant	*5
Principal floor, corridors	100	Terminal station, Congressional Li-	
Lobby of the House	60	brary	5
Speaker's room	5	Room of Clerk of House	8
File clerk's room	14	Hall to same	4
House library	34	Disbursing office, House	12
House library (book rooms)	16	Fan rooms, House	18
Public toilet	22	Stairways to House	4
Engineers' department, House	13	Enrolling room, House	15
Stenographers' room, House	8		

COMMITTEE ROOMS, HOUSE WING.

Patents	11	Public Lands	11
Foreign Affairs	18	Labor	8
Naval Affairs	13	Agriculture	4
Military Affairs	16	Invalid Pensions	19

SENATE WING.

Gallery floor corridor	77	File room (reporters')	4
Book rooms, basement	17	Public toilet room	10
Carpenter shop, basement	11	Supreme Court cellar	10
Elevator room, basement	5	Storerooms	26
Senate kitchen	3		

COMMITTEE ROOMS.

Commerce	14	Foreign Relations	13
Naval Affairs	4	Rules	5
District of Columbia	9	Agriculture	17
Vice-President's room	6	Epidemic Diseases	4
Claims	13		

* Ceiling fans.

SPECIAL WORK.

Wiring for new elevator, Senate, and for the ventilating fans in House and Senate public toilet rooms; for 9 new chandeliers, and for all fan motors.

Statement giving days of minimum and maximum electrical energy supplied by electric-lighting plant and cost of operation.

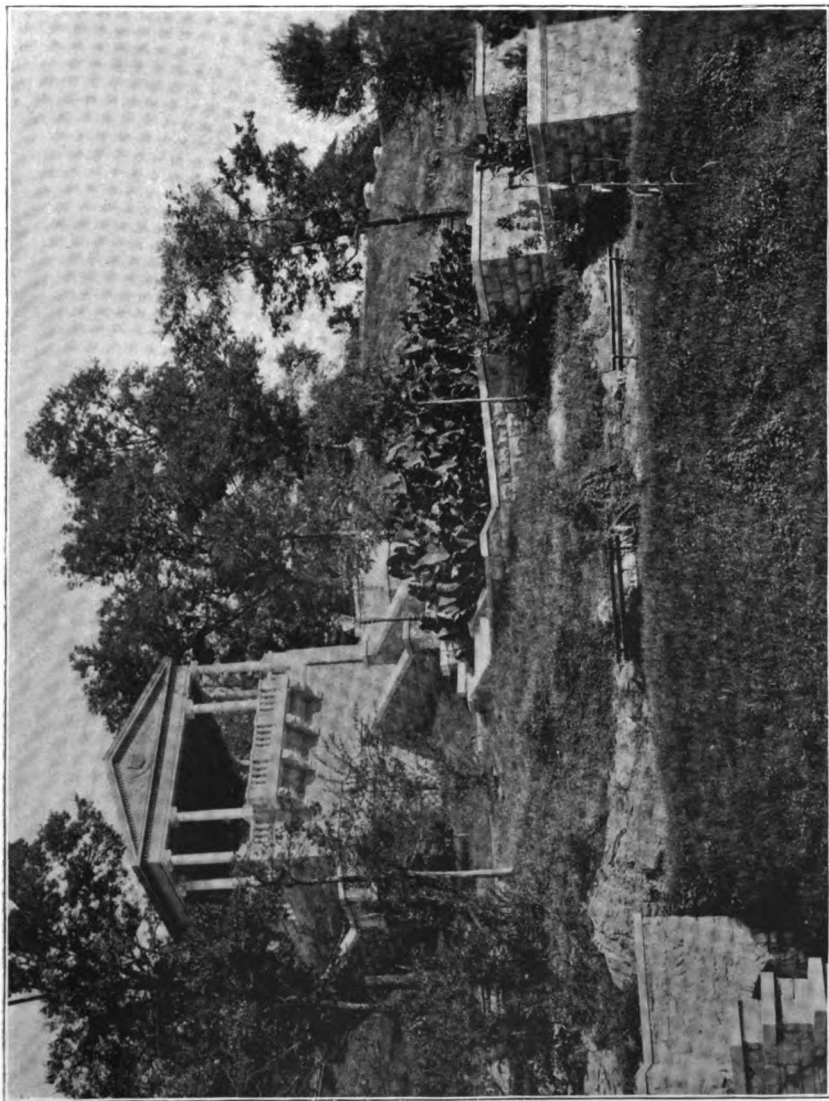
Minimum load, August 21.		Maximum load, April 18.	
Time.	Amperes.	Time.	Amperes.
1 a. m.	1,020	8 a. m.	1,200
2 a. m.	1,020	9 a. m.	1,350
3 a. m.	1,000	10 a. m.	1,450
4 a. m.	1,000	11 a. m.	1,550
5 a. m.	300	12 m.	1,450
6 a. m.	300	1 p. m.	1,500
7 a. m.	300	2 p. m.	1,500
8 a. m.	300	3 p. m.	1,500
9 a. m.	340	4 p. m.	1,500
10 a. m.	340	5 p. m.	2,200
11 a. m.	300	6 p. m.	2,735
12 m.	350	7 p. m.	3,910
1 p. m.	320	8 p. m.	3,980
2 p. m.	300	9 p. m.	4,010
3 p. m.	200	10 p. m.	3,960
4 p. m.	280	11 p. m.	3,980
5 p. m.	300	12 p. m.	4,030
6 p. m.	300	1 a. m.	3,800
7 p. m.	630	2 a. m.	2,800
8 p. m.	960	3 a. m.	1,500
9 p. m.	1,020	4 a. m.	1,300
10 p. m.	1,020	5 a. m.	600
11 p. m.	1,020	6 a. m.	800
12 p. m.	1,020	7 a. m.	1,000

Average: 75 kilowatts per hour. 119 electrical horsepower per hour. \$54.35 per day for labor. \$16.20 per day for coal. \$1.50 per day for oil and waste. Average operating expenses per hour, \$3.	Average: 279 kilowatts per hour. 447 electrical horsepower per hour. \$54.35 per day for labor. \$35.25 per day for coal. \$2.70 per day for West Virginia oil. \$1 per day for oil and waste. Average operating expenses per hour, \$5.14.
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Respectfully submitted.

EDWARD OLARK,
Architect, United States Capitol.

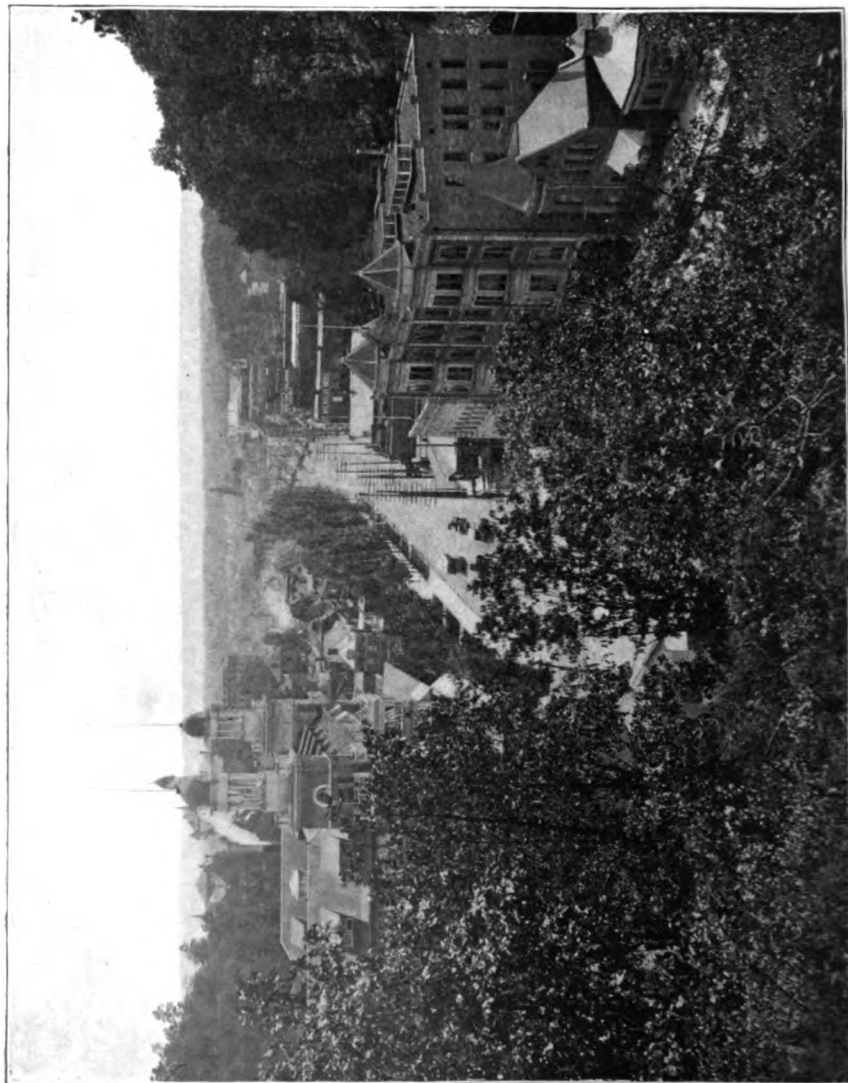
The SECRETARY OF THE INTERIOR.



HOT SPRINGS RESERVATION. LOOKING SOUTHEAST, SHOWING PAVILION AT MAIN ENTRANCE.

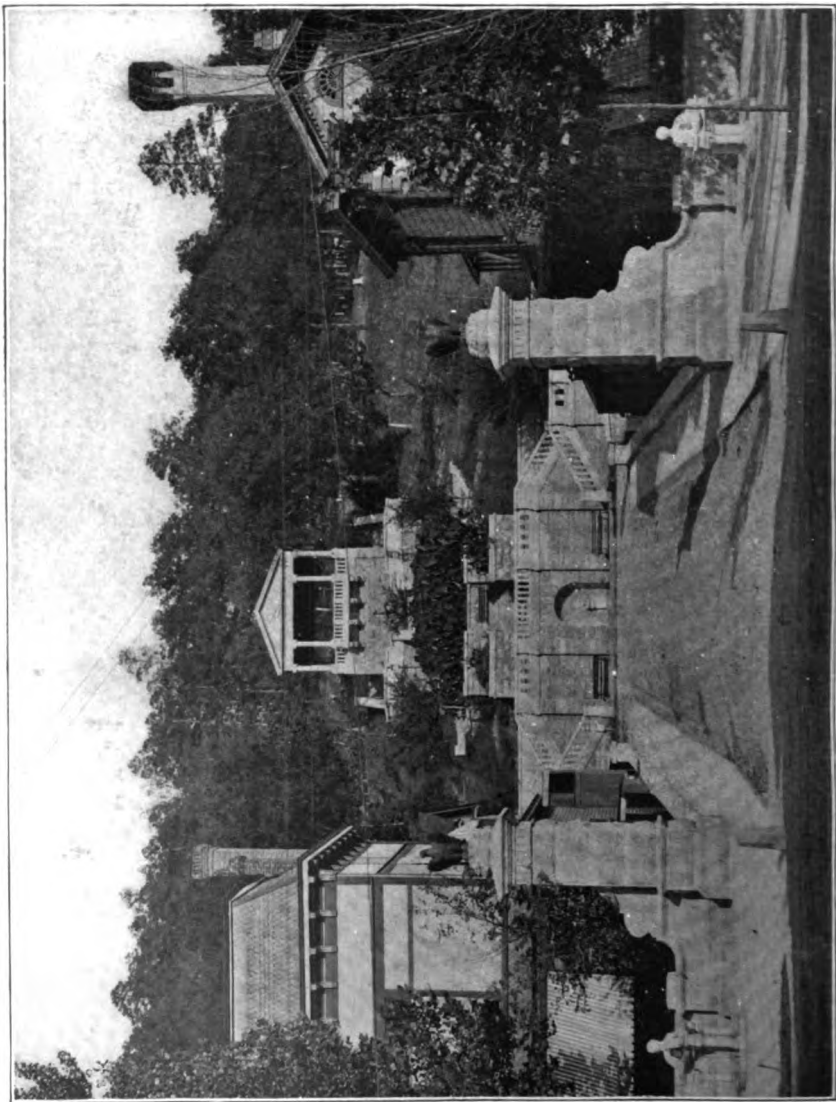


LOOKING EAST, SHOWING STEPS AND WALK NORTH OF PAVILION, AT MAIN ENTRANCE.



HOT SPRINGS. CENTRAL AVENUE, LOOKING SOUTH, SHOWING ARLINGTON HOTEL AND BATH-HOUSE ROW ON HOT SPRINGS RESERVATION ON LEFT.

Taken from the western point of North Mountain



HOT SPRINGS RESERVATION. LOOKING EAST, SHOWING MAIN ENTRANCE (COMPLETED).

REPORT

OF THE

SUPERINTENDENT OF THE HOT SPRINGS RESERVATION.

HOT SPRINGS RESERVATION,
OFFICE OF THE SUPERINTENDENT,
Hot Springs, Ark., June 30, 1898.

SIR: I have the honor to respectfully submit my annual report covering the operations of this office for the fiscal year ended June 30, 1898.

The principal improvements accomplished since the date of my last report have been the completion of the Whittington avenue lakes and park, the improvement and extension of the roads and drives, and building additional walks and drainage on the permanent reservation, each of which will be noticed under proper headings in this report.

BATH HOUSES.

During the period since my last report, one new bath house of 19 tubs has been added to the active list, bringing the total number of leases up to twenty-four; of these, twenty are active bath houses, two are sanitariums, one lease to the Hot Springs Medical Company for manufacturing medicines, and one lease to John J. Sumpter, under which no bath house has yet been erected.

The total number of tubs covered by all these leases is 538, requiring 538,000 gallons of hot water daily to supply them. Rating the bathing capacity of each tub at 15 persons per day, sufficient bathing accommodations are now provided for 8,070 persons daily. This is largely in excess of present requirements or any that seem likely to be made soon.

The attendance of visitors this year has been larger than for some time past, and the bath houses have seemed to enjoy a good business for the first time in three or four years.

Of the whole number of bath houses in Hot Springs, only seventeen have been operated continuously from June 30, 1897, to June 30, 1898. From the receipts of these houses I submit a table showing the number of tubs in each, the rate per course charged for baths, the cost of the bath house, the number of baths sold, the amount received therefor, the per cent of gross earnings on the cost of the house, and the earnings per tub; also the number of attendants and helpers employed, the amount paid to them for attendants' fees, estimated by the approved rate of \$2.25 per course, showing the average amount made by the attendants in each house, and the average amount made by each of the whole number employed.

Rate per course charged for baths, etc.

Name of bath house.	Tubs.	Rate per course.	Cost of bath house.	Baths sold.	Amount received for baths.	Gross earnings.	Income from each tub.	Attendants.	Amount paid attendants.	Average amount made by attendants.
						<i>Per ct.</i>				
Arlington	40	\$10.00	\$54,000.00	27,792	\$13,280.00	24	\$330.75	13	\$2,976.75	\$229.00
Alhambra	40	5.00	50,000.00	23,725	5,650.00	11	141.25	5	2,552.50	510.50
Avenue	20	6.00	20,000.00	10,801	3,086.00	15	154.35	5	1,156.50	231.30
Hale	26	7.00	30,500.00	19,445	6,482.00	21	249.00	6	2,083.00	347.25
Horse Shoe	30	6.00	17,000.00	11,025	3,150.00	18	130.00	5	1,181.25	236.25
Hot Springs	16	7.00	38,000.00	11,701	3,899.00	10	244.00	4	1,253.25	313.31
Imperial	25	8.00	40,000.00	23,725	9,040.00	22	362.00	7	2,542.50	363.51
Lamar	40	7.00	28,000.00	21,111	7,035.00	25	176.00	7	2,261.25	323.03
Magnesia	30	6.00	17,000.00	14,995	4,284.00	25	143.00	5	1,606.50	321.30
Maurice	21	7.00	30,000.00	36,720	12,243.00	40	583.00	8	3,935.25	491.90
Osark	22	4.00	24,000.00	20,643	3,932.00	16	179.00	6	2,211.75	366.63
Palace	23	7.00	16,000.00	12,172	4,053.00	25	176.00	5	1,802.75	260.55
Rammelsberg	18	3.00	22,000.00	34,473	4,923.00	22	274.00	4	8,692.25	923.06
Rector	12	7.00	15,000.00	14,000	4,865.00	33	405.00	4	1,563.75	390.93
Rockafellow's	20	4.00	20,000.00	10,380	1,976.00	9	99.00	3	1,111.50	370.50
Waverly	20	6.00	14,000.00	14,000	4,170.00	29	209.00	4	1,563.75	390.93
Superior	16	6.00	26,000.00	8,183	2,840.00	9	146.00	5	875.50	175.50
	419	.....	490,500.00	306,089	94,358.00	20	225.00	96	33,870.00	353.00
Park (open 5 months)	40	8.00	35,000.00	7,500	2,856.00					
Eastman (open 2½ months)	40	10.00	53,000.00	7,703	3,670.00					
Great Northern (open 1 month)	19	7.00	15,000.00	1,300	399.00					
St. Josephs Infirmary	4	6.00	5,000.00	1,816	516.00					
Cheshire, sanitarium	8	6.00	1,233.00							
Hot Springs Medical Co	4									
Jno. J. Sumpter	4									
Total	538	.....	569,733.00	324,307	101,799.00					

¹ Average.² Amount paid attendants equals 36 per cent of gross receipts of the bath houses and 7½ per cent of the cost of the houses.

From this table it will be seen that the average gross earnings of the 17 houses is 20½ per cent on the original cost of the buildings and equipment, the average earning per tub being \$225.

I have not been able to get the amounts paid for operating expenses and maintenance with sufficient accuracy for use in this table, but from that which I have been able to get I feel sure that nearly if not the whole amount of gross earnings have been consumed by several of the houses in operating expenses and maintenance.

The whole amount of money invested in bath houses in Hot Springs is \$569,733.

The whole number of baths given by them has been 324,207, for which they have received \$101,799; to this should be added \$33,870 attendants' fees, which makes the total amount paid for baths during the fiscal year \$135,669.

The total number of baths given during the year, including 184,690 given by the free bath house, is 508,997.

ATTENDANTS' FEES.

In the preparation of this table care has been taken to get the status of the bath-house attendants before the Department in as near their true position as possible; the basis used has been the regular course

price of \$2.25 for 21 baths, taking into consideration nothing for "tips" and compensation for extra services, which it is safe to estimate amount to half as much as the regular attendants' fees. The table also shows that several of the houses employ more attendants than the business of the house seems to require, which in a certain sense decreases the average amount made by each to a lower amount than it should be.

The duties required of attendants are neither laborious or particularly confining; the bathing is generally done between the hours of 8 o'clock in the morning and 4 to 5 o'clock in the afternoon, while the healthfulness or unhealthfulness of those engaged as bath-house attendants is amply attested by the present healthful condition of those who have followed this occupation for the past five to twenty years.

The table herein referred to shows that the bath-house attendants have received for their services an amount equal to 36 per cent of the total receipts of the bath houses, while the bath houses themselves have made only 20½ per cent gross on the amount invested. It is safe to assume that the bath-house attendants at Hot Springs are as well paid for the labor performed as any other class of people, and that the rates of \$2.25 per course of 21 baths or 15 cents for a single bath, as they are at present allowed by the Government to charge, is alike fair to them and to the public who use the baths at this place.

The following table will show the rate charged for baths at the several bath houses per course of 21 baths and for single baths. The two right-hand columns give the price with attendants' fees added:

Name of bath house.	Rate per course of 21 baths.	Rate for single bath.	Rate per course, attendants' fees added.	Rate for single bath, attendants' fees added.
Arlington	\$10.00	\$0.50	\$12.25	\$0.65
Avenue	6.00	.30	8.25	.45
Alhambra	5.00	.25	7.25	.40
Cheshire	6.00	.30	8.25	.45
Eastman	10.00	.50	12.25	.65
Great Northern	7.00	.35	9.25	.50
Hale	7.00	.35	9.25	.50
Horse Shoe	5.00	.25	7.25	.40
Hot Springs	7.00	.35	9.25	.50
Imperial	8.00	.40	10.25	.55
Lamar	7.00	.35	9.25	.50
Magnesia	5.00	.25	7.25	.40
Maurice	7.00	.35	9.25	.50
Ozark	4.00	.20	6.25	.35
Park	8.00	.40	10.25	.55
Palace	7.00	.35	9.25	.50
Rockafellows	5.00	.25	7.25	.40
Rector	7.00	.35	9.25	.50
Rammelsberg	3.00	.20	5.25	.35
Superior	6.00	.30	8.25	.45
St. Josephs Infirmary	6.00	.30	8.25	.45
Waverly	6.00	.30	8.25	.45

ELECTRIC BATHS.

Electric baths and massage treatment may now be had at several of the bath houses, for which they are allowed by the Department to charge as follows:

1 electric bath	\$1.00
7 electric baths	5.00

The prices are to include the regular hot bath and the services of an attendant.

INT 98—MIS—60

Massage treatment.

One-fourth to one-half hour.....	\$0. 75
One-half to one hour.....	1. 00
7 treatments one-fourth to one-half hour	5. 00
7 treatments one-half to one hour	6. 00

These prices to include alcohol and cocoa oil rubbing.

Table showing the date and expiration of the several leases now in force.

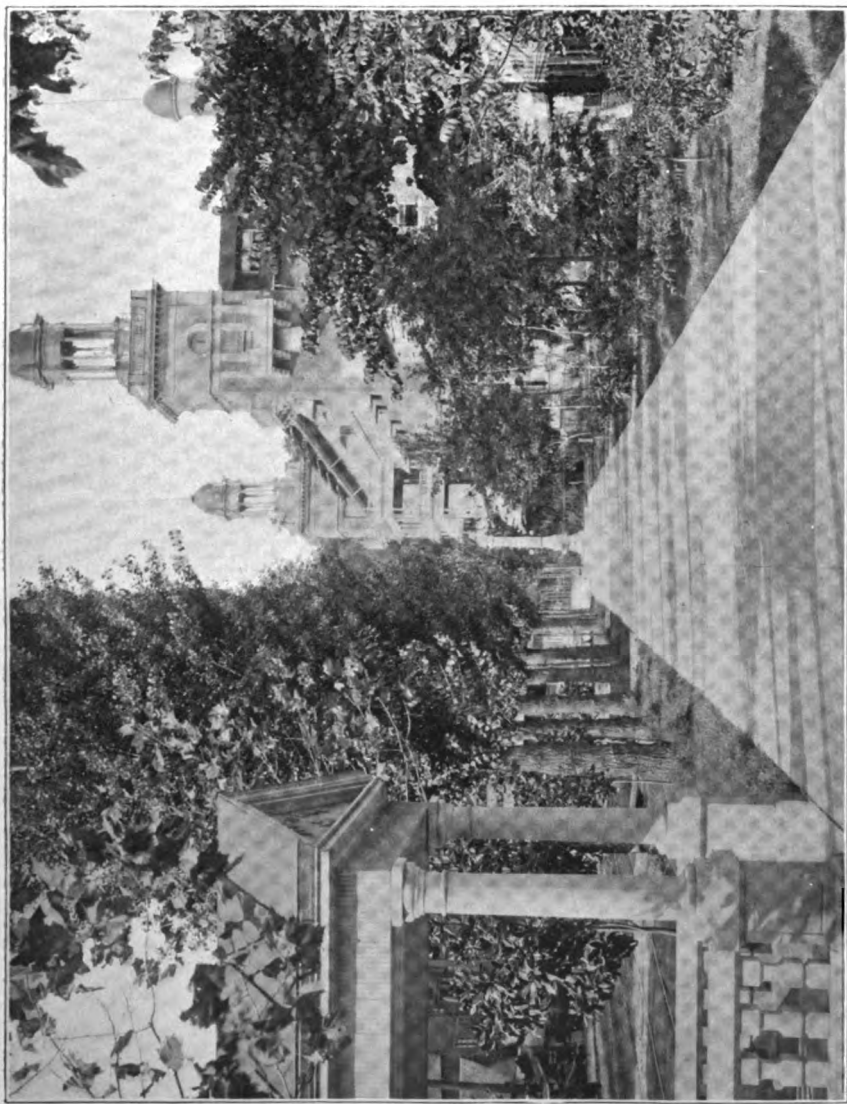
Name of bath house.	Lessee.	Tubs.	Date of lease.	Expiration of lease.
Alhambra	Alhambra Bath House Co	40	Feb. 28, 1894	Feb. 28, 1914
Arlington	Arlington Hotel Co	40	Mar. 3, 1892	Mar. 2, 1912
Avenue	Avenue Hotel Co	20	Feb. 17, 1898	Dec. 31, 1902
Cheshire	Cheshire Improvement Co.	8	Aug. 7, 1896	Aug. 7, 1906
Eastman	New York Hotel Co	40	May 12, 1892	May 12, 1912
Great Northern	Curnel S. Williamson	19	May 26, 1897	May 15, 1912
Hale	Roots & Eastman	26	Jan. 1, 1893	Dec. 31, 1907
Horse Shoe	D. Fellows Platt	30	Jan. 1, 1896	Dec. 31, 1909
Hot Springs	Mark J. Smith	16	Jan. 1, 1893	Dec. 31, 1902
do	Hot Springs Medical Co	4	July 24, 1894	July 24, 1904
Imperial	Fred N. Rix and J. L. Barnes	25	Jan. 1, 1892	Dec. 31, 1906
Lamar	M. C. Tombler and D. C. Buckstaff ..	40	Jan. 1, 1897	Dec. 31, 1916
Magnesia	Chas. B. Platt	30	Jan. 1, 1896	Dec. 31, 1909
Maurice	Maurice, Convers & Maurice	21	Jan. 1, 1897	Dec. 31, 1916
Ozark	Latta & Carhart	22	Jan. 1, 1892	Dec. 31, 1902
Palace	Samuel W. Fordyce	23	Jan. 12, 1893	Dec. 31, 1906
Park	Park Hotel Co	40	May 12, 1892	May 12, 1912
Rammelsberg	George H. Buckstaff	18	Jan. 1, 1892	Dec. 31, 1898
Rector	Henry M. Rector	12	Apr. 16, 1894	Apr. 16, 1904
Rockafellow's	Charles N. Rockefellow	20	July 1, 1896	June 30, 1898
St. Joseph's Infirmary	Sister Mary Aloysius	4	Dec. 31, 1896	Dec. 31, 1901
Sumpter	Jno. J. Sumpter	8	Mar. 7, 1894	Mar. 7, 1904
Superior	Proctor & Myar	16	Sept. 15, 1896	Sept. 14, 1906
Waverly	New Waverly Hotel Co	20	Mar. 24, 1893	Mar. 24, 1913

BATH-HOUSE DRUMMING.

During the period since my last report bath-house drumming has been materially reduced, as much so indeed as seems possible to do under the present conditions. Public drummers are not allowed to bring people to the bath houses, and the bath houses are not allowed to sell tickets to people brought by them. That which is still carried on is done on the incoming trains, at the hotels and boarding houses, and at the offices of drumming doctors.

The continuance of the practice of drumming in Hot Springs is mainly due to the drumming doctors, who pay from 40 to 75 per cent of their fees for patients. The small amount that the hotels, boarding houses, or bath houses could pay is but a small per cent of that which keeps the drummer up in his profession; hence it is that the drumming doctor is mainly responsible for the continuance of this practice, which has done so much to retard the progress of Hot Springs.

The hotels, boarding houses, and doctors' offices where most of the drumming is done are located off of the Government reservation, and are not subject to any restriction that can be laid by the superintendent. There are ninety physicians practicing medicine in Hot Springs, and from forty to forty-five of these solicit patients through public drummers and other agencies not recognized by the regular medical profession. Some of these make no efforts to conceal the methods they employ to get patients, and openly assert that they are here to make money.



LOOKING NORTH ON RESERVATION, SHOWING ALUM SPRING PAVILION, HOKE SMITH FOUNTAIN, AND ARLINGTON HOTEL;
PORTION BATH-HOUSE PARK TO RIGHT.

It is reasonable to presume that a physician who has so far departed from the standard of medical ethics as to indulge in these practices has done so for some cause, either a lack of proficiency in his profession or the want of sufficient moral character to impel him to an honorable course among his fellows. In either case those who visit Hot Springs seeking to have their health restored or preserved should be given protection against this class of imposition. While this protection can not be afforded by the State authorities under the laws in force at present or by the superintendent, I am of opinion that sufficient authority is vested in the Secretary of the Interior under the act of Congress approved March 3, 1891, to promulgate such additional rules and regulations for the government of the bath houses, as will effectually put a stop to this most injurious practice; and for this purpose I respectfully recommend that a board of three eminent physicians be appointed by the Secretary—one of whom shall be the medical officer in charge of the Army and Navy General Hospital at this place, who shall be executive head of said board, the other two to be resident physicians of Hot Springs—whose duty it shall be to examine all physicians who desire to practice medicine on the Government reservation, both as to their qualifications and moral standing in the medical profession, and to issue certificates only to those of good moral and professional character; and that the bath-house rules and regulations now in force be amended by an additional rule prohibiting the bath houses from bathing anyone taking medical advice from a physician, who does not hold a certificate from the said board above referred to.

Under these conditions it is probable that many of the doctors who now flourish in Hot Springs through the employment of drummers would either leave or conform to the rules governing the regular practice of medicine; in either case the community would be relieved of the "doctor drummer," who has done more to blast the reputation of Hot Springs than all other agencies combined. When he can not enjoy the large percentage paid him by the doctors, not enough will be left for him to flourish on, and he will either have to change his profession or depart.

I shall be pleased to furnish further information upon this subject, touching the details and operations of it, if desired by the Department.

FREE BATH HOUSE.

During the past fiscal year the free bath house has been open continuously and has furnished free baths to a larger number of indigent people than any previous year since its inception.

The average number of persons furnished baths daily has been 506; of these 297 have been white men, 42 white women, 106 colored men, and 61 colored women.

The diseases from which these people suffered were, mainly, syphilis and numerous blood diseases which come as a result of syphilis, and rheumatism. I have no means of knowing the actual number of persons cured by the use of these baths, but the ratio of those cured or greatly benefited has not decreased from last year. It is safe to say that the use of the baths at the free bath house for a reasonable time, whether or not accompanied by medical treatment, either cures or greatly benefits at least 75 per cent of all persons to whom the baths are furnished at this house.

The charity extended by the Government to its indigent people through the medium of this bath house is much greater than can be

realized without coming in contact with the persons using the baths. Many are afflicted with the most loathsome diseases and without the means of procuring medical advice or medicines; yet in most cases, after taking the baths for several days, improvement becomes discernible, and in many cases after sixty or ninety days the bather goes away apparently cured.

The management of the house becomes less troublesome each year, and the demand for baths by persons who can not be classed as indigent, and for that reason can not be furnished baths, has materially decreased. The free bath house now seems to have attained a position where it may enjoy the commendation of the people at large, and especially those whom it has restored to health and through that to citizenship, in place of being made the medium of complaint by persons who have wanted to use it for selfish purposes.

The expenses for operating the house during the fiscal year has been as follows:

Salary of manager	\$1,020.00
Salary of male attendant	660.00
Salary of female attendant	360.00
Salary of scavenger	120.00
Expenses for fuel, lights, water, and supplies	187.73
Total	2,347.73

Number of baths given from June 30, 1897, to June 30, 1898, 184,690. Estimated cost of each bath, 1½ cents. The number of persons bathed daily has been 506, divided as follows:

White males	297
White females	43
Colored males	106
Colored females	61
Total	506

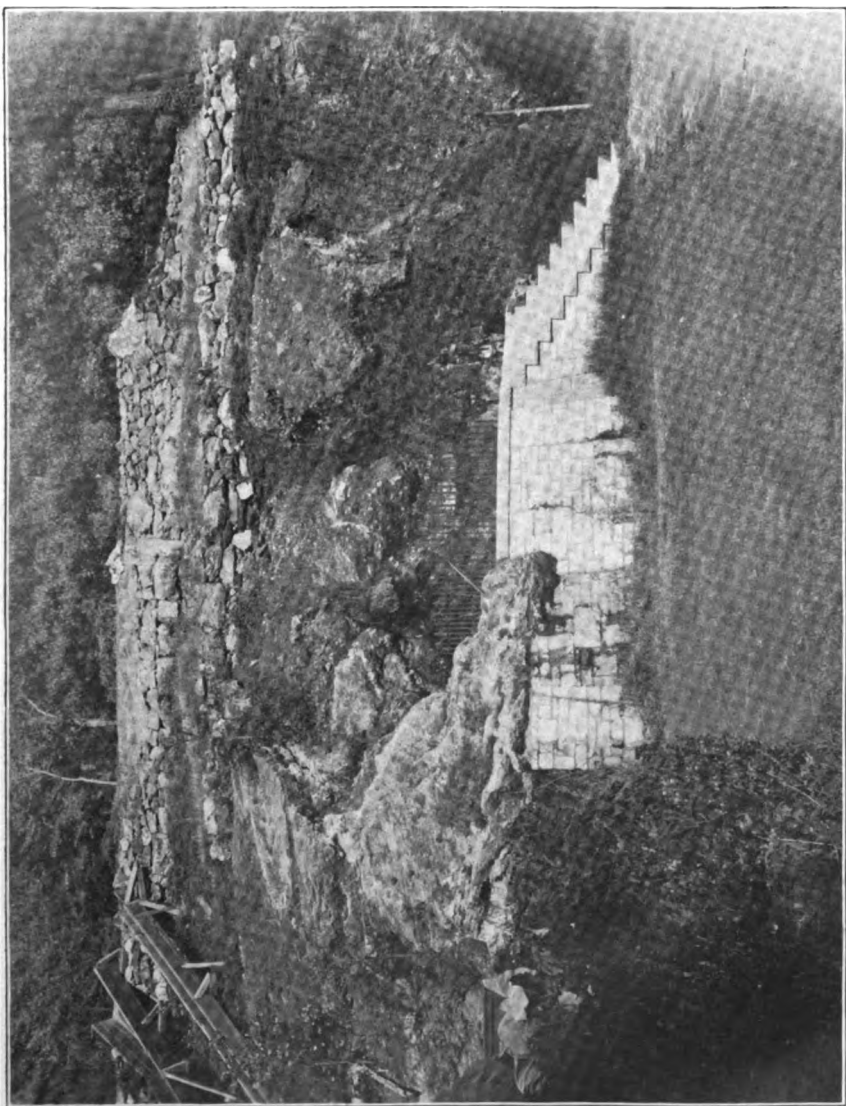
FREE DISPENSARY.

Under your direction of March 22, 1898, the second story of the free bath house, comprising five rooms and a hall, heretofore occupied by the bath-house attendants, has been vacated and the rooms repaired and refitted for use as a free dispensary and turned over to Dr. H. O. Perley, United States Army, and his associates for this purpose, on May 1, 1898.

Upon the vacation of the rooms Dr. Perley was invited to inspect them and suggest such repairs and additions of furniture as seemed necessary for the purpose for which the rooms were to be used. This he very kindly did, and the rooms have been repaired where necessary and supplied with operating tables, chairs, and such other furniture as was required for the immediate purposes of the dispensary.

Since May 1 the rooms have been in use for this purpose by Dr. Perley and his associates, and they are doing much good by way of medical advice to the indigent people who use the free baths. The actual good to be accomplished by this dispensary is hampered for want of medicines, which it has been hoped would be supplied by public contributions. So far this has not been done with sufficient liberality to allow the physicians in charge to carry out the purposes for which the dispensary was established.

In order that this may be accomplished with as little delay as possible and the dispensary brought more fully to the notice of the public, by



LOOKING EAST, SHOWING TUFA BLUFF AND THE SECURED AND INCLOSED HALE SPRING BELOW.

whom it is expected to be sustained, I respectfully recommend that the sum of \$50 be allotted from the reservation fund to be used in the purchase of such drugs for the use of the dispensary as the physicians in charge may designate as most urgently needed for immediate use. With this I feel sure that the free dispensary will be brought to the notice of the public in such way as to merit its liberal support in future.

Items of expense incurred in fitting these rooms for use as a free dispensary, amounting to \$270.15, was transmitted to the Department with my letter of June 2, 1898.

THE PUMPING STATION.

Since my last report this building and the machinery therein has received the attention necessary to keep it in a good state of repair and to prevent damage from rust and such other causes as would accrue to the damage of machinery set up for use and not at the same time being used. It does not seem probable that this machinery can ever be used to the advantage of the Government in Hot Springs, inasmuch as the purpose for which it was purchased is now prohibited by a resolution of Congress. Neither the building nor the machinery is serving any useful purpose for the Government and there is but little probability of its usefulness in the future.

I respectfully recommend that the machinery be sold and the proceeds applied to refitting the building to make it available for use as an office for the superintendent; the reason being that the present office, which consists of two small rooms in the residence building, is situated on the northeast confines of the town, remote from the business center, and not nearly so accessible as it would be if located at the pumping station. Besides gaining additional room, which is desirable on account of the increased amount of business now transacted in this office, I am of the opinion that if the office was located in a public place where it came to the notice of visitors, that many of them who are unfortunate enough to fall into the hands of drummers would report cases of violation of the bath house rules and regulations that would not otherwise be known; and many would come to the office for information about Hot Springs who do not find it now, and that such information as could be conveniently furnished in this way would be greatly appreciated by strangers coming here and would soon redound to the credit of Hot Springs and the Government.

OFFICE AND RESIDENCE BUILDING.

In my report for the fiscal year ended June 30, 1897, mention was made of needed repairs to this building and the furniture therein. Some repairs are needed to be made to the roof, which has never been good, and also to the plastering, which, owing to the poor foundation on which the building stands, is badly cracked and broken loose from the walls and ceilings. The best mode of treatment for the inside of this building would, in my opinion, be to take off as much of the plastering as becomes loose and replace it with a rough coat, and then paper the walls and ceilings. The furniture and carpets are much worn, having been in use without repairs for about eight years.

I respectfully request that the sum of \$541.50, or so much thereof as may be necessary, be allotted for the repairs of this building and additions to the furniture therein.

HOT SPRINGS CREEK ARCH.

The part of this arch which traverses the reservation front is under the care of the superintendent, and requires attention and some repairs after almost every heavy rain. The large volume of water which passes through it at times and the swiftness of the current often undermines the walls where they have not been founded on solid rock. This class of damage can not be neglected, as the arch is in danger of caving in until it is repaired. Such damage as has occurred during the year has been promptly repaired and the arch is at present in good condition.

Balance to the credit of the allotment for repairs of this arch at the date of my last report	\$251.03
Expended for repairs during the year.....	70.33
Balance.....	180.70

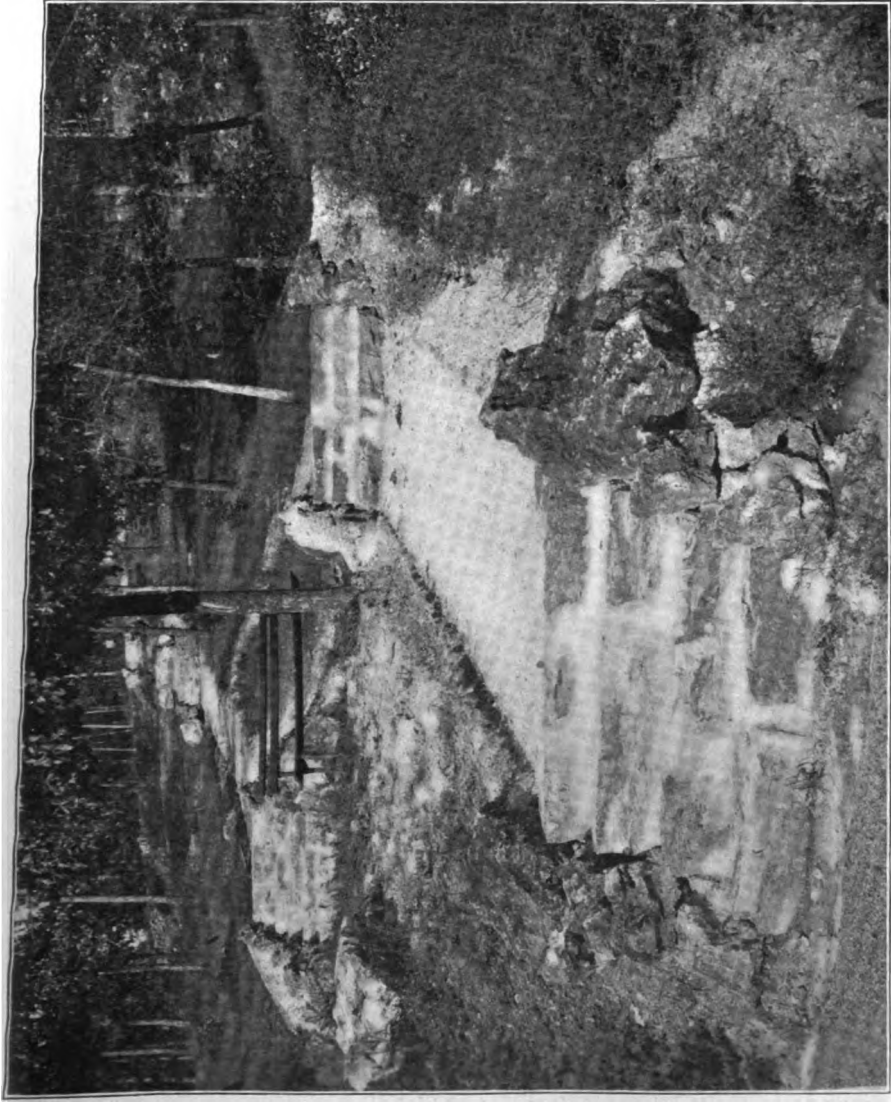
HOT WATER DRINKING FOUNTAINS.

The hot water drinking fountains, five in number, are located in Bath House Park, convenient to Central avenue, the main thoroughfare of the city, and are much resorted to and used, both by visitors and citizens. Besides these, there are four open hot springs where the hot water may be drunk from the fountain head as it issues from the rock. The park, in the midst of which these springs rise and in which the fountains are located, is constantly kept in the best possible state of cultivation, and is the distinctive and attractive feature of Hot Springs. From year to year, as the shrubbery attains additional growth, the park becomes more beautiful, until now there are but few more attractive spots in the country. It is the aim of the superintendent to add to this each year, as the improvements progress, such features of attractiveness as the means at his disposal will permit.

THE FOUNTAIN STREET COLD SPRING.

Within the city and near its limits are located a number of more or less valuable mineral springs, the waters from which are sold either at the springs or by venders on the street. From this strangers arriving often get the impression that cold drinking water can only be had by buying it from the venders or in the hotels or public places. The opening of the Fountain street cold spring has dissipated these impressions, and the spring is resorted to daily by hundreds of people. It has been properly improved by the erection of a tasteful wooden pavilion, which fronts on Fountain street and affords convenient ingress and egress for those using the water.

I respectfully recommend that the following table be continued and that steps be taken to have an official analysis made of the waters of the principal springs, some thirty in number. I further respectfully recommend that all the springs be renumbered, their temperature, flow, and elevation recorded, and their location marked by suitable monuments, with the numbers thereon, and, where necessary, repairs be made so that they will be properly secured.



LOOKING EAST, SHOWING CONTINUATION OF WALK ABOVE HALE SPRING, LEADING TO TOP OF MOUNTAIN.

Springs on Hot Springs Mountain Reservation.

[Datum of levels: The lowest point on the Hot Springs Reservation, being on the east side where the Hot Springs Railroad enters the same, approximates 500 feet above the tide water of the Gulf.]

No.	Temperature.	Elevation.	Character.	No.	Temperature.	Elevation.	Character.
	<i>Degrees.</i>	<i>Feet.</i>			<i>Degrees.</i>	<i>Feet.</i>	
1	77	91.4	Constant flow.	38	123	90.2	Constant flow.
2	76	98.7	Do.	39	125.5	92.2	Do.
3	124	98	Do.	40	112	93.3	Do.
4	124	98.3	Do.	41	157	113.5	Do.
5	80	115.6	Do.	142	-----	110.2	Do.
6	103	171.6	Do.	43	144	164.4	Do.
7	115	172.2	Do.	144	-----	162.8	Do.
8	121.5	117.5	Do.	45	111	171.8	Do.
9	122	179.6	Do.	146	-----	109.8	Do.
10	121.5	181.2	Do.	47	144.5	176.5	Do.
11	105	120	Do.	48	91	178.9	Do.
12	111	117.5	Do.	49	181	178.1	Do.
13	135.5	85.2	Do.	50	145	179.6	Do.
14	137	84.3	Do.	51	144	182.8	Do.
15	134	84.7	Do.	52	142	178.3	Do.
16	101	135.8	Do.	53	145.5	186.1	Do.
17	-----	140	Seepage.	54	146	188.1	Do.
18	83	158	Constant flow.	55	122	92.7	Do.
19	84	159.3	Do.	56	133	95.3	Do.
20	83	162.8	Do.	57	128	100.2	Do.
21	106	107	Do.	158	-----	101.9	Do.
22	122	118.2	Do.	59	133	102	Do.
23	125	123.8	Do.	60	134.5	112.9	Do.
24	113	127.7	Do.	61	133	186.1	Do.
25	111	127.7	Do.	62	109	186.3	Do.
26	106	127.9	Do.	63	83	186.2	Do.
27	127.5	130.3	Do.	64	135	186.6	Do.
28	145	129.4	Do.	65	141	186.1	Do.
29	90	140.4	Do.	66	87	185.3	Do.
30	134.5	148.3	Do.	167	-----	113	Intermittent.
31	147	133.2	Do.	68	181	85	Constant flow.
32	124	95.7	Do.	69	83	89.7	Do.
33	140	89.8	Do.	70	89	89.4	Do.
34	120	91.8	Do.	71	94	89.3	Do.
35	135	91.8	Do.	72	122	-----	Do.
36	110	90.4	Do.	73	122	-----	Do.
37	120	155.5	Do.				

¹ Under Big Iron bath house.

² Inaccessible; near Arsenic spring.

³ Under bath house on hill.

⁴ In Arlington yard; flows after heavy rain; 184°.

CARE AND CULTIVATION OF THE PARKS AND GROUNDS.

The extent of the grounds on Hot Springs Mountain, lying east from Central avenue and the bath houses, which have been brought under cultivation for park purposes is about 30 acres, and much preliminary work has been done on from 30 to 40 acres additional.

The work in this park during the past year has been most effective, and the view now presented from Central avenue, the main thoroughfare of the city, is a very pleasing one. The improvements during the past year have consisted in setting additional grounds in grass, planting shrubbery and trees, building additional walks, and drainage, and, generally, the cultivation and embellishment of the grounds for park purposes. The matter of drainage has, on account of the steepness of the grounds, been one that has required considerable attention. Being to a large extent surface drainage, it naturally requires more or less repairs after each heavy rain. During the year all the old walks and paths have been reconstructed and made comfortable by the addition of stone steps at suitable intervals to relieve the steep grade, and new walks built where convenience or necessity seemed to suggest. The addition and extension of these walks, the rapid growth of the shrubbery and trees, and the considerable area of grounds now set in grass begin to bring out the possibilities of this park and to inspire many

favorable comments from the visitors on the improvements being accomplished by the Government for their pleasure and convenience while residing at Hot Springs.

The increased area of grounds brought under cultivation as parks adds greatly to the permanent cost of maintenance, and will soon render the present force of foresters and gardeners inadequate for the care of the roads and walks and the cultivation of the parks.

At the proper time, such cuttings as can be made from the shrubbery and flowers will be made, and propagated for planting in the spring.

ROADS AND DRIVES.

The system of roads and drives as originally laid out on the Hot Springs Mountain has been completed, and the roads during the year have received such repairs and attention as was necessary, and have been in very constant use. These roads being almost entirely on the sides of the mountain and only provided with surface drainage, necessarily suffer from heavy rains, and for this reason require more than ordinary care. They are kept in good repair and are constantly open to the public. These drives enter the reservation through the main entrance on Central avenue, through the grounds of the Army and Navy General Hospital, and from Fountain street, and are about $3\frac{1}{2}$ miles in length.

During the year a new branch of road extending from the head of Fountain street to North Mountain and connecting the drives on Hot Springs Mountain has been graded, so far as could be done without the use of blasting material. It is now passable for horseback riding and vehicles, but a large amount of blasting is necessary to bring it to a uniform width and put it in a comfortable condition for driving.

In addition to this, about 3 miles of road on North Mountain has been cleared and made available for horseback riding and ready for grading.

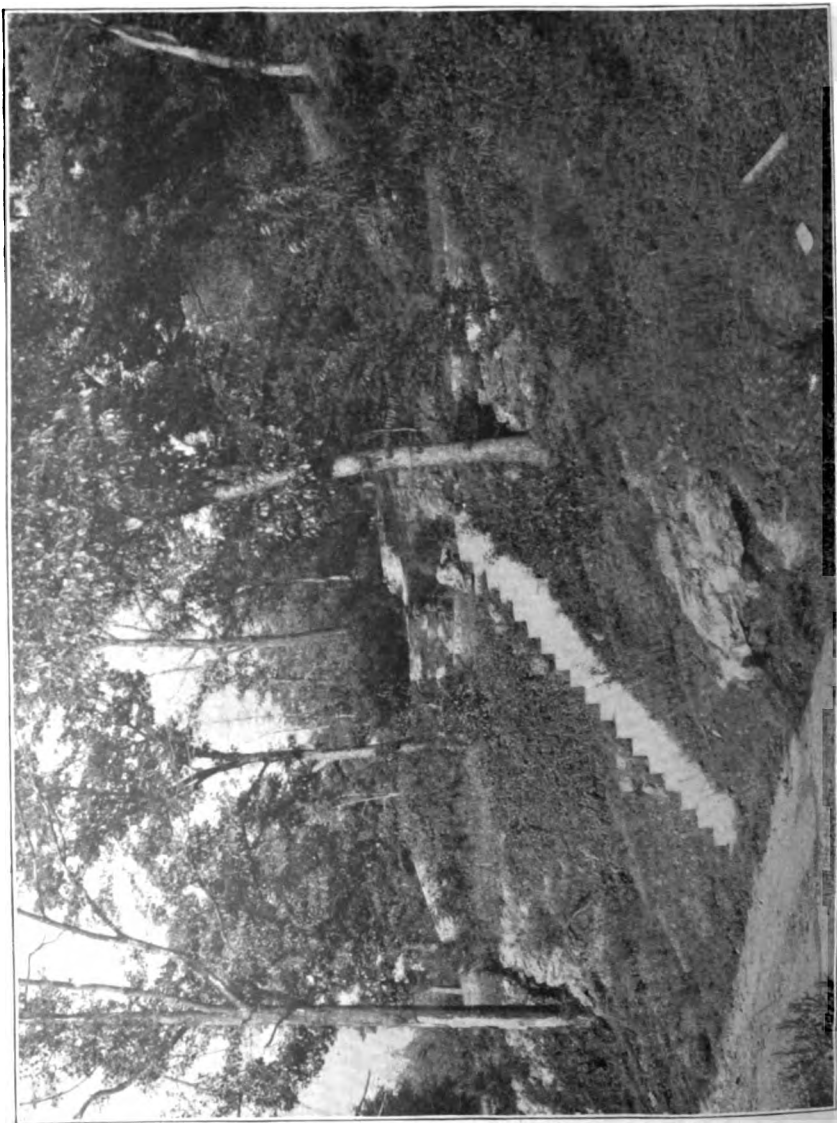
I have uniformly stated in my reports that the roads and drives seemed to be more appreciated by the visitors than almost any other class of improvement made by the Government, the particular reason being that many of them while taking the baths and medical treatment are advised to take considerable outdoor exercise, and the means for doing this is greatly facilitated by the drives and walks over the reservations.

I respectfully recommend that the sum of \$500, or so much thereof as may be necessary, be allotted for the completion of the Fountain street drive, from the Fountain street entrance to near the junction of Hot Springs and North mountains where the system of roads and drives on both mountains converge.

THE WHITTINGTON AVENUE IMPROVEMENT.

This improvement, consisting of two small lakes and a park, has been completed and was opened to the public on June 30, 1898, since which time it has been in constant use and is much appreciated by invalids now residing here. The area of this reservation is only 11 acres, nearly half of which is taken up by the lakes. The park which covers the balance of the grounds is even at this time, with only a half year's growth on the shrubbery and flowers, a beautiful park, and affords much pleasure and enjoyment to both visitors and citizens.

The cultivation of the grounds has been very successful; a good turf of grass has been secured on most of the grounds, while more than the ordinary amount of the shrubbery planted, it seems at this time, will survive the summer weather and reach maturity. Several large beds



LOOKING NORTHEAST, SHOWING STONE STEPS ON ARLINGTON SUPPLY ROAD LEADING UP TO DAVE SPRING.

of summer flowers, phlox, zinnias, marigolds, pinks, and caladiums, have been very successfully cultivated, and have added great beauty to the park. The large number of native forest trees in this park also add greatly to its attractiveness in summer, inviting to rest, as they do by their deep cooling shades, the afflicted and the health seekers who so numerously abide in Hot Springs.

The unfavorable condition of the grounds as to the shape in which they were defined by the Hot Springs Commission originally has made their improvement into a park a much more difficult matter than would have been the case under other conditions. The grounds are very narrow and are traversed by Whittington Creek, which at times has a swift and destructive current, making it necessary for the protection of the grounds from overflow to straighten and widen the channel and protect the banks by dry-rock masonry at points of contact with the swift current at times of high water; also to put in dams or dikes at points above the lakes to prevent them from being filled up by the washing of sand and gravel and other drift. At the beginning of these improvements this creek had no well-defined channel that would confine its waters, and each freshet seemed to fill it up in one place and open a new channel in another, so that it was practically a succession of gullies and gravel beds extending down to solid rock out of which the lakes and park have been made. In making the excavation for the lakes it was found necessary to take out from 2 to 4 feet depth of solid rock in order to obtain sufficient depth of water. Some apprehension was had at the beginning of this improvement as to whether or not Whittington Creek would afford sufficient water for these lakes in the dry season. It is doubtful whether it would or not, but with the springs developed in making the excavation, sufficient water has been obtained to keep fresh water continually passing through the lakes to keep it clear and wholesome.

The lower lake, which is somewhat the larger, has an area of 43,600 square feet and holds 1,180,000 gallons of water. The upper lake has an area of 35,400 square feet and contains 930,000 gallons of water. Each of these lakes is finished with sloping banks from the water level to street grade and provided with two sets of white limestone steps leading down to the boat landings. The banks are being set in Bermuda grass and water-growth trees are being planted, which in a short time will give the lakes a very pleasing appearance.

The total cost of this improvement has been \$29,595.08, expended as follows:

Rubble masonry for retaining walls, arches, tunnels, dams, bridges, and culverts	\$5, 187.00
Dry masonry for retaining walls made necessary in straightening and widening the creek channel and to prevent washing at the points of contact with the current	1, 620.00
White limestone for building columns and areas at main carriage entrance and for coping and steps	750.00
Wrought-iron fence to inclose the lakes and grounds of the park	3, 805.80
For 2 lake pavilions, 1 music stand, 2 park pavilions, 2 tennis court pavilions, 1 park gardener's cottage and stable, and 6 bridges	2, 561.87
For excavation, grading, and for labor and teams to build the lakes and prepare the grounds for use as a park	13, 348.00
For laying water pipes to sprinkle and irrigate the grounds of the park	640.00
For 50 park seats distributed through the grounds of the park	150.00
For shrubbery, grass and flower seed, and extra soil for planting and bedding	200.00
For tile and wooden drainage necessary to protect the grounds from washing	557.05
For tools, implements, engineering, and other incidental expenses	770.36
Total expenditures	29, 590.08

The total allotment for this improvement has been as follows:

February 28, 1896	\$20,000.00
March 17, 1897	5,000.00
November 4, 1897	5,000.00
Total	30,000.00
Total expended	29,590.08
Balance unexpended	409.92

The following table will show the balance yet standing to the credit of several allotments for special improvements which have been completed, and for tools and material. I think it desirable that these amounts should remain subject to the disposal of the superintendent for repairs to the pavilions and the other purposes for which they were allotted, and for emergencies:

Purpose for which allotted.	Date of authority.	Amount allotted.	Amount expended.	Balance.
Repairs to creek arch	Dec. 20, 1895	\$500.00	\$319.30	\$180.70
Tile for drainage	Jan. 16, 1896	100.00	52.44	47.56
Tools and implements .....	....do.....	200.00	97.82	102.18
Limestone coping	Jan. 20, 1896	620.00	510.04	109.96
Stone pavilion at main entrance .....	....do.....	2,250.00	2,009.05	240.95
Fountain street pavilion .....	....do.....	1,600.00	1,186.50	413.50
Care and cultivation of grounds	Jan. 8, 1897	370.00	218.65	151.35
Bath House Park .....	....do.....	200.00	144.25	55.75
Six bronze vases at main entrance	Jan. 20, 1896	172.00	.....	172.00
Whittington avenue improvement	Feb. 28, 1896	20,000.00	20,000.00	.....
Do	Mar. 17, 1897	5,000.00	5,000.00	.....
Do	Nov. 4, 1897	5,000.00	4,590.08	409.92

The following table will show the amounts to the credit of the different items of improvement which have been completed, and, in my opinion, these balances are no longer necessary:

Purpose for which allotted.	Date of authority.	Amount allotted.	Amount expended.	Balance.
Repairs at office and residence building	Oct. 18, 1893	\$628.00	\$607.85	\$20.15
Repairs at free bath house .....	....do.....	880.00	832.95	47.05
Tools, implements, horse and cart	Nov. 9, 1894	516.85	512.15	4.70
Repairs to propagating pit	Nov. 30, 1894	69.00	62.46	6.54
Repairs to pumping station	Mar. 5, 1895	60.00	55.00	4.40
Sprinkling system	June 8, 1895	283.00	280.63	2.37
Brick sidewalk to free bath house	Jan. 16, 1896	95.00	85.50	9.50
Repairs at office building	Jan. 16, 1895	800.00	241.00	559.00
Repairs at free bath house .....	....do.....	190.00	46.50	143.50
Mending concrete walk .....	....do.....	100.00	95.98	4.02
Trees, evergreens, and shrubbery .....	....do.....	200.00	174.87	25.13
Rubber hose .....	....do.....	50.00	43.15	6.85
Additional steps at entrance	Jan. 20, 1895	50.00	43.81	6.19
Four park lamps .....	....do.....	200.00	189.96	10.04
Iron rail for bath-house site No. 1 .....	....do.....	200.00	148.87	51.13
Repairs at office building	Jan. 8, 1897	364.65	355.79	8.86
Repairs at free bath house .....	....do.....	437.80	377.63	60.17
Repairs at pumping station .....	....do.....	276.75	269.23	7.52
Improvement of Alum Spring .....	....do.....	350.00	340.32	9.68



LOOKING EAST, SHOWING "CAVE SPRING."
Taken at head of steps on Arlington Supply Road.

Table showing personnel of employees on the reservation, the Congressional district from which appointed, amount of compensation, and duties.

Name, occupation, and duties.	Compensation per year.	Congressional district whence appointed.
William J. Little, superintendent.....	\$2,500.00	Second Arkansas.
William W. Little, watchman at pumping station and assistant to superintendent; duties are to see that the building and machinery of pumping station are cared for, and act as assistant to the superintendent.....	600.00	Do.
James Daniels, messenger at superintendent's office; duties are to act as messenger to the superintendent, and have charge of the furnace and lights at the office building.....	180.00	Do.
William Sumpter, manager of free bath house; duties are, to have charge of, issue, and collect tickets at free bath house, and carry out orders of the superintendent.....	1,020.00	Do.
Simon Schultice, male attendant at free bath house; duties are, to have charge of and keep in a cleanly condition the pools and men's bathing department of the free bath house, attend the furnace in winter, clean the rooms of the free dispensary, and act as manager in absence of latter.....	600.00	Do.
Mary L. Schultice, female attendant at free bath house; duties are, to have charge of and keep in a cleanly condition the pools and women's department of the free bath house.....	360.00	Do.
John H. Jones, scavenger at free bath house; duties are, to remove all rubbish, paper, and rags, and to preserve sanitary conditions under direction of the manager.....	120.00	Do.
Charles Payton, night policeman on the reservation; duties are to have a general supervision over all Government property from 9 p. m. to 9 a. m.; keep a lookout for fires; see that no stock or persons commit depredations on the reservation, and make arrests when necessity requires.....	600.00	Do.
Christopher C. Cooper, day policeman on the reservation; duties are to have a general supervision over all Government property from 9 a. m. to 9 p. m.; see that no stock or persons commit depredations on the reservation, observe and report all cases of infractions of the bath-house rules and regulations, and to make arrests when necessity requires.....	480.00	Do.
Ed Hardin, waterman on the reservation; duties are to have charge of the distribution of all the hot water and see that each bath house gets the amount allotted it, and to act as foreman to the reservation force of foresters and gardeners.....	600.00	Do.
A. A. Graham, forester and gardener.....	480.00	Do.
Charles Schmike, forester and gardener.....	480.00	Do.
Alfred Eddleman, forester and gardener.....	1.50	Do.
Jonathan A. Jordan, forester and gardener.....	1.50	Do.
Dan T. Richardson, forester and gardener.....	1.50	Do.
Peter Nelson, forester and gardener.....	1.50	Do.
John W. Dowdy, forester and gardener.....	1.50	Do.
James Horan, forester and gardener.....	1.50	Do.

¹ Per day.

NOTE.—Duties of the foresters and gardeners are to cultivate and care for the flowers, trees, and shrubbery; keep up the roads, drives, and walks; make and maintain other improvements on the reservation under the direction of the superintendent.

Receipts.

The receipts of this office for water and ground rents for the fiscal year ended June 30, 1898, have been as follows:

Bath house.	Tubs.	Amount.	Bath house.	Tubs.	Amount.
Alhambra.....	40	\$1,200.00	Palace.....	23	\$690.00
Arlington.....	40	1,200.00	Park.....	40	1,200.00
Avenue.....	20	600.00	Rammelaberg.....	18	540.00
Cheshire Sanitarium.....	8	240.00	Rector.....	12	360.00
Eastman.....	40	200.00	Rockafellow's.....	20	600.00
Great Northern.....	19	71.25	St. Joseph's Infirmary.....	4	120.00
Hale.....	26	1,780.00	Superior.....	16	480.00
Horsehoe.....	30	900.00	Sumpter.....	4	120.00
Hot Springs.....	16	480.00	Waverly.....	20	600.00
Imperial.....	25	750.00	Hot Springs Medical Company.....	4	120.00
Lamar.....	40	200.00	Eastman, extra water.....		30.00
Magnesia.....	30	900.00	Arlington, ground rent.....		2,500.00
Maurice.....	21	1,630.00			
Osark.....	22	660.00			18,171.25

NOTE.—Great Northern bath house paid water rent from May 15, 1898, date of completion.

Disbursements.

Salaries per annum:	
Superintendent.....	\$3,500.00
Watchman at pumping station and assistant to the superintendent.....	600.00
Messenger at superintendent's office.....	180.00
	\$3,280.00
Manager of free bath house.....	1,020.00
Male attendant at free bath house.....	680.00
Female attendant at free bath house.....	260.00
Scavenger at free bath house.....	120.00
	2,100.00
Reservation waterman; also acts as foreman of reservation foresters and gardeners.....	600.00
Night policeman on the reservation.....	600.00
Day policeman on the reservation.....	490.00
	1,690.00
Salary of two foresters and gardeners, at \$40 per month, earned.....	916.80
Salary of six foresters and gardeners, at \$1.50 per day, earned.....	2,779.47
	3,696.07
Total amount disbursed for salaries.....	10,816.07
Disbursed on account of—	
Fuel and lights at superintendent's office.....	210.00
Fuel and lights at free bath house.....	158.23
Horse feed and bedding.....	118.64
4 gas street lamps on reservation.....	96.90
2 incandescent lights on Hoke Smith Fountain.....	36.00
City water for buildings, sprinkling, and irrigating, and ice.....	202.80
Free dispensary.....	270.15
Repairs to creek arch.....	70.33
Repairs to concrete walk.....	15.75
Incidental expenses, including repairs to buildings, springs, fountains, tools, material, etc.....	397.29
	1,572.09
Total amount disbursed from this office.....	12,388.16
Amount disbursed from Department on account of improvements.....	6,517.62
Amount disbursed by superintendent.....	12,388.16
Total disbursements from Hot Springs Reservation fund.....	18,905.68

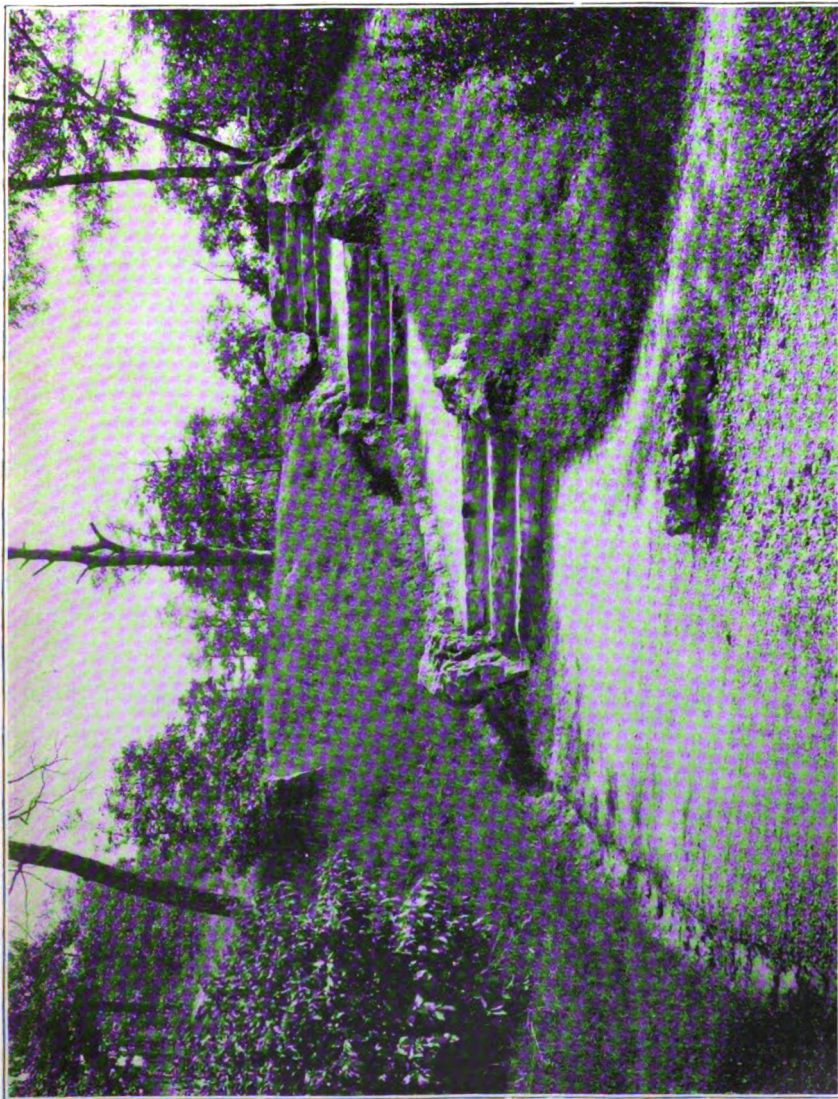
GOVERNMENT LOTS.

There are yet unsold 157 of the lots originally laid out and platted by the Hot Springs Commission, which have been offered for sale at the previous public sales of lots in Hot Springs, but were not bid in on account of too high appraisement. These lots were last appraised in 1895, at which time it seemed probable that a successful sale of the lots could be had; but before the sale had been advertised an epidemic of smallpox prevailed in Hot Springs, which prostrated the place to such an extent as to seriously affect the price of real estate, and for this reason the sale contemplated at that time has never been ordered. I do not think that real estate in Hot Springs has since that time appreciated to the same value it was at the time of the contemplated sale, but I think it has reached a stable position and that a successful sale of Government lots might be had at the pleasure of the Department.

The time necessary in which to revalue the lots and advertise the sale would probably extend to March of next year, which, in my opinion, would be as favorable a time to dispose of these lots as could be selected in the next few years. Considering the advisability of augmenting the improvement fund so as to allow the completion of the roads and drives on North and West mountains, and to further improve and extend the parks on Hot Springs Mountain, and generally continue the system of improvements laid out by Captain Stevens, I respectfully recommend that the necessary authority be issued for holding this sale in March or April of 1899.

RECOMMENDATIONS.

On June 30, 1898, there was in the Treasury to the credit of the Hot Springs improvement fund \$9,102.17. The net revenues from water and ground rents, which may be estimated upon for the fiscal year 1898



LOOKING SOUTHEAST, NEAR UPPER RESERVOIR AND CAVE SPRING, SHOWING STEPS AND WALK OF THE TUFA AND NATURAL ROCK STEPS BEING CONSTRUCTED ON RESERVE.

and 1899 as above the ordinary expenditures from this office, is \$5,700, which, added to the amount in the Treasury, gives \$14,802.17 which will be available for the improvements during the year. Of this amount \$4,300 has been allotted for the improvement of the free bath house, leaving the balance available for further improvements \$10,502.17, from which I respectfully recommend that allotments be made for the following items of material and improvements:

Whittington Park:

For 200 yards soil for bedding and planting.....	\$150.00
For additional shrubbery and evergreens	50.00
For 400 pounds grass seed	60.00
For flower seed, cuttings, and bulbs.....	35.00
For 300 feet rubber hose, nozzles, spray nozzles, and hose reels.....	60.00
For tools and incidental repairs	54.92
	<hr/>
	409.92

Bath house and reserve parks:

For 200 yards soil for bedding and planting.....	150.00
For additional shrubbery and evergreens	50.00
For additional shade trees.....	75.00
For 400 pounds lawn-grass seed.....	60.00
For 300 feet rubber hose, nozzles, etc.....	60.00
For extending sprinkling and irrigating system.....	200.00
For tile, cement, and brick for extending and repairing drainage.....	300.00
	<hr/>
	895.00

Office and residence building:

For repairing roof.....	25.00
For painting roof	36.00
For repairing plastering	43.00
For mending and reupholstering furniture.....	60.00
For papering ten rooms and three halls	162.50
For rugs, mats, window shades, and curtains	65.00
For carpets for offices, parlor, and halls	150.00
	<hr/>
	541.00

Fountain street drive: For blasting material, labor, and teams to complete the Fountain street drive from near the cold spring to its intersection with the system of roads and drives at the junction of Hot Springs and North Mountain.....	500.00
Roads and drives on North Mountain: For continuing the system of roads and drives on North Mountain as heretofore laid out; length, including entrances to Park and Central avenues, about 4 miles.....	5,000.00

ADMINISTRATION.

During the period since my last report the affairs of this office have progressed in a very satisfactory manner. All the items of improvement for which the allotments have been available during the year have been completed. The completion of Whittington Park, which has been the principal item of improvement for this year, was somewhat delayed, as a result of which the planting of shrubbery and grass in this park could not be done until late in the spring; but the conditions have been favorable to its rapid growth, and on a large part of the grounds a good turf of grass has been secured, which is a prerequisite to successful park cultivation on uneven grounds like these. The young shrubbery has been successfully started and the flower beds have commanded universal admiration; a large number of rose cuttings, made last year, have been planted and are now in good, thriving condition. I have every reason to be well satisfied with the present year's cultivation of this

park. Only the customary care and cultivation for the next few years is necessary to make this one of the most beautiful little parks in the country.

Satisfactory progress has been made in the extension and cultivation of Reserve Park; additional grounds have been taken into cultivation, additional shrubbery planted, and new walks added, all of which have added greatly to the general attractiveness of the park.

Bath-house drumming has, as usual, demanded close attention, and has been to some extent reduced. It is so inseparably connected with doctor drumming in Hot Springs, and there are so many unscrupulous persons connected with it, that it gives a great deal of trouble and requires a great deal of the superintendent's time which should be given to the matters of improvement on the reservation and the regular transaction of the office business. It is my sincere desire that the measures proposed in this report for the suppression of doctor and bath-house drumming will receive the earnest consideration of the honorable Secretary, and that he will take such action as will allow them to be put into effect as soon as possible.

A much larger number of inquiries than usual from persons desiring to come to Hot Springs for treatment have been received and answered from this office. A larger number of visitors find their way to the office to ask information about the hot springs, the bath houses, etc., than heretofore.

The management of the free bath house has given less trouble than heretofore, although a larger number of persons have been provided with baths than during any previous year. As much liberality as has seemed consistent with the proper management of the house has at all times been allowed in issuing tickets for free baths and so far as I have been able to observe all indigent persons applying for free baths have been supplied.

The free dispensary, lately put in operation in the rooms over the free bath house, promises to be of great benefit to the poor people using these baths, as well as a great help in the management of the bath house.

I have the honor to be, very respectfully, your obedient servant,
WM. J. LITTLE, *Superintendent.*

The SECRETARY OF THE INTERIOR,
Washington, D. C.



LOOKING EAST, SHOWING CHARACTER OF STEPS AND WALK, LEADING TO TOP OF MOUNTAIN, NOW BEING CONSTRUCTED.

REPORT
OF THE
ACTING SUPERINTENDENT OF THE YELLOWSTONE NATIONAL PARK.

DEPARTMENT OF INTERIOR,
YELLOWSTONE NATIONAL PARK,
OFFICE OF THE SUPERINTENDENT,
Mammoth Hot Springs, Wyo., September 30, 1898.

SIR: I have the honor to submit the following report of the condition, management, protection, and improvement of the Yellowstone National Park from November 10, 1897, the date of the final report of my predecessor, to September 30, 1898:

Maj. Gen. S. B. M. Young, United States Volunteers (Colonel Third Cavalry, acting superintendent), left the Yellowstone National Park on November 15, 1897, and the duties of that position have devolved upon me, as being next in command, and subsequently, in compliance with telegraphic orders from the Department, from that time to the present, except during the period from March 13 to July 11, 1898, when I was on detached service, during which time Lieut. G. O. Cress, Fourth Cavalry, ably performed these duties.

At the time of departure of my predecessor there remained an unexpended balance of \$66.01, with which to keep in repair the road from the Mammoth Hot Springs to Gardiner City, which, on account of its location in the canyon of the Gardiner River, must be constantly worked in the winter season; to protect the game of the park during the winter months from poachers; to open up the usually traveled route of tourists, who begin visiting the park on the 1st of June, and keep the same in repair until the appropriation for this year should become available. Owing to the very small balance of the appropriation remaining unexpended I had to rely mainly for protecting the game upon the services of Lieutenant Lindsley, Fourth Cavalry, and Scouts Morrison and Whittaker, with the assistance of the soldiers on winter station and in garrison. The work done by this officer, and these men, was of the highest importance to the park in the protection of its game, to a large extent prevented poaching, and resulted, in connection with the mild weather of last winter, in a large increase of the game life of all descriptions. The way in which these objects were accomplished will be treated under the heads of "Protection" and "Improvement" later on in this report.

The stage robbery which occurred in the park on August 14, 1897, an account of which was given by my predecessor in his report, was

brought to an end by the trial and conviction of George Reeb and Gus Smitzer, at Cheyenne, Wyo., before United States court, and they were sentenced to two and one-half years in the penitentiary.

TRAVEL.

To supply the various demands of the public for transportation through the park, it has been found necessary to have and adopt different kinds, viz: Regular stage lines, steamboat transportation on Lake Yellowstone, licensed, and private transportation, whether by wagon, pack train, horseback, or bicycle. The former is represented by the Yellowstone National Park Transportation Company, running its stages from Cinnabar, Mont., on the north of the park, the railroad terminus of a branch line of the Northern Pacific Railway, and over the usually traveled route of tourists, via Mammoth Hot Springs, Norris, Upper Geyser Basin, over the continental divide to Yellowstone Lake, Canyon, Norris, Mammoth Hot Springs, and thence to Cinnabar. The Monida and Yellowstone Stage Company (Humphrey & Haynes) enter the park at Riverside, from Monida, a station on the Oregon Short Line, and travel over the same route as the other stage line, as follows: Fountain Hotel, Upper Geyser Basin, over continental divide to Yellowstone Lake, Canyon, Norris, Mammoth Hot Springs, Norris, thence via Riverside to Monida.

The steamboat company operates one steamboat, which daily makes the trip from the lunch station on the lake (known as West Thumb) to the Lake Hotel, and affords the tourist, whatever means of transportation he may use in making the park trip, an opportunity to take an exceedingly beautiful and interesting trip of some three hours on the lake.

Licensed transportation includes a number of individuals, who, under license from the Department, are authorized to personally conduct parties through the park, furnishing the necessary camp equipage and food. Private transportation, as its name implies, includes all other going through the park, using transportation of their own, of whatever nature.

For the purposes of protection and police, it has been found necessary to register at certain places in the park all persons traveling through it, exclusive of those transported by the regular stage lines, and below will be found a table giving the number of travelers in the park this year and the kind of transportation used.

Number of persons registered at stations during the season of 1898.

Number and location of station.	Camping parties.				Licensed transportation.			
	June.	July.	Aug.	Sept.	June.	July.	Aug.	Sept.
1. Mammoth Hot Springs.....	241	512	1, 174	256	66	166	352	65
2. Norris a b								
3. Canyon a								
4. Lake b	71	538	1, 263	469	42	112	240	30
5. Thumb a								
6. Upper Basin	25	436	1, 242	471	9	70	295	58
7. Lower Basin b	77	890	1, 327	423	17	73	428	61
8. Snake River b	24	210	557	219			None.	
9. Riverside b	88	366	911		19	55	88	
10. Soda Butte b	99	182	170	114			None.	

a No registration required.
b Winter station.

Number of persons traveling with registered guides (pack trains).

June	None.
July	39
August	74
September	31

The aggregate number of tourists visiting the park from opening of season (June 1) to September 30 was 6,534. The aggregate number carried over the regular route by the Yellowstone National Park Transportation Company, was 2,196, and by the Mouda and Yellowstone Stage Company, 234; aggregate number carried through by licensed transportation of personally conducted camping parties, 890; aggregate number carried through in private transportation, 3,437; bicyclers, foot travelers, etc., included. During the season 2,256 tourists took the trip across Yellowstone Lake on the steamboat of the Yellowstone Lake Boat Company. Of this number, those who came into the park by the regular stage lines numbered 1,225, and those who went through the park by other means of transportation numbered 1,031.

To determine whether or not the park is becoming more traveled, and fulfilling gradually the mission for which created, viz, as a "pleasuring ground for the benefit and enjoyment of the people", a comparison of totals is made, from record, from 1895 to present date:

Number of tourists former years.

	1895.	1896.	1897.	1898.
Camping parties	2, 594	1, 797	4, 454	3, 437
Licensed transportation	374	454	1, 354	890
Yellowstone Park Association	2, 470	2, 408	4, 873	2, 207
Total	5, 438	4, 659	10, 680	6, 534

It will be seen that 1897 brought the greatest number of tourists to the park, but the comparison should not be made with that year as a standard, as a great number of Christian Endeavorers, after their meeting in San Francisco, Cal., returned, via the Northern Pacific Railway, and visited the park. Their number can not be determined, but making reasonable deductions on account of this particular and exceptional class of travel, it will be seen that the season of 1898 in the park shows an increased number of tourists. This is yet more remarkable, as the conditions of the country, owing to the war, diverted more or less attention from the park, and probably decreased in no inconsiderable degree the number of persons traveling for pleasure during the summer.

SYSTEM OF PATROLING AND POLICING.

The most difficult task that the acting superintendent has to accomplish is to carry out the provisions of the dedicatory act of the park, setting it aside for the benefit and enjoyment of the people. Were it thrown open to the people, without restrictions of any sort, it would be only a short time before it would cease to be a pleasuring ground, while, on the other hand, the restrictions should be of such a nature only as to preserve intact, not only for the present but for the future, the salient and wonderful features which have made the park the most remarkable, as well as the most scientifically interesting, place in the world. The restrictions, as now established and sanctioned by the Interior Department, and enforced by the acting superintendent of

the park through the military force under his command, though sometimes misunderstood and not appreciated by a few of the travelers of the park, seem to fully and completely accomplish the object for which the park was set aside, and I am glad to say the intentional violators of the rules and regulations of the park have been very few.

The system of enforcing them by means of soldiers stationed at nearly regular distances on the usually traveled routes, and who patrol these routes, and especially by guards from these detachments, who are always present at the most interesting points, preventing their desecration and the destruction of the natural phenomena, has been established for some years, and no better could be devised. I know of no case where these soldiers, in the discharge of these very particular and exacting duties, have been other than courteous and polite toward the public, at the same time enforcing the law. These rules and regulations will be found in the appendix marked A.

In addition to these duties, it has been found necessary to keep a complete and accurate record of all who enter and travel through the park, except those who enter by the stage lines, a record of whom is kept at hotels, and this is also done by the soldiers stationed at the various points in the park.

HOTELS.

The Yellowstone Park Association owns and controls, under lease from the Department, hotels at the following places in the park: Mammoth Hot Springs, Lower Geyser Basin, Yellowstone Lake, Canyon; also lunch stations at Norris Geyser Basin, Upper Geyser Basin, and Yellowstone Lake. The hotels are so located as to stage travel that tourists using this transportation always finish up their day's journey at a hotel; the lunch stations being merely places to obtain noonday refreshments en route to hotels. It is, I believe, the intention of the association to build a hotel at the Upper Geyser Basin this fall. I trust this will be done, and completed in time for the tourist season of next year. Frequent demands have been made for a hotel at this most wonderful spot; besides, by the erection of this hotel, the present route through the park will be so divided up that much fatigue and discomfort to the tourist will be avoided.

PERMANENT CAMPS.

Under authority from the Department, Mr. W. W. Wylie has established permanent camps at the following points: Apollinaris Spring, Upper Geyser Basin, Yellowstone Lake, and Canyon, besides having lunch stations at a point about midway between Norris and Lower Geyser Basin, and near the Yellowstone Lake.

INSPECTION BY ACTING SUPERINTENDENT OF THE PARK.

Ever since the opening of the season, and until its close, frequent inspections have been made by me and other officers of the command, of all stage lines and other transportation, of the hotels, lunch stations, and of Mr. Wylie's permanent camps and lunch stations, and of the steamer on the Yellowstone Lake.

I have always found the entire personnel of the Yellowstone National Park Transportation Company polite, courteous, and efficient; their horses and vehicles always in first-class condition, and suited in every way to handle the business required of it.

The Monida and Yellowstone Stage Company is in the first year of its existence, and has employed the following:

Four-horse drivers.....	10-12
Two-horse drivers.....	4
Stock tenders.....	7
Assistant superintendents.....	2
Blacksmith.....	1
Bookkeeper.....	1

They had in use the following vehicles:

Eleven-passenger Concord coaches.....	12
Three-passenger Concord surries.....	4
Concord buggies.....	2

Also:

Horses.....	80
Four-horse Concord harness.....sets..	16
Two-horse Concord harness.....do...	8
Blankets, dusters, and complete barn supplies.	

This stage company is of the first order in every respect; has given first-class service to its patrons, has opened up a new route to the park through a beautiful country, and I have found its entire personnel, by courtesy and politeness, desirous of making its route popular with the traveling public, which it will undoubtedly be.

Messrs. Humphrey & Haynes, who control the line, are both practical business men, with experience in this business, and are always courteous and obliging.

The steamer *Zillah*, running daily trips on the Yellowstone Lake, under the lease of the Lake Boat Company, and under the personal direction of Mr. E. C. Waters, her captain, who is also president and general manager of the company, has given full satisfaction to the public. I have made many trips on this boat, always found her in perfect condition, and thoroughly safe. The entire personnel of the boat are always attentive and polite to the passengers, doing everything for their pleasure and enjoyment. In addition to the regular tourist business, this steamer has had many excursions.

The hotels and lunch stations of the Yellowstone Park Association, under the able direction and management of Mr. J. H. Dean, fulfill every requirement of the traveling public. No better accommodations and food are furnished anywhere in the United States, under like conditions. The hotels are thoroughly clean and neat throughout, and the service excellent. It should be remembered that all articles of food, except meat, are shipped here, as there is no local market from which the daily supply of edibles can be obtained. I have not heard a single complaint from any guest of any of the hotels.

The permanent camps of Mr. W. W. Wylie seem to fulfill a demand on the part of a certain number of travelers in the park who wish to enjoy whatever benefits and pleasures may be received from camp life. I inspected frequently each of his camps and lunch stations, and found them all neat and clean, with all the comforts one could expect to find in camp. It is not possible to make a comparison between the accommodations furnished by these camps and the hotels. Each comes fully up to the requirements of its especial class, and the personal preference of each visitor to the park must and will determine the way of living while in the park.

Campers are another class of visitors to the park who furnish their own transportation, tentage, etc., and with whom the daily patrols

from stations have most to do in reference to the police and protection of the park.

The transportation under the heading "Licensed" has also been inspected and the camps of these parties looked after, wherever met. Satisfaction seems to have been given in all cases, for I have not heard one word of complaint from any of their patrons. A list of this licensed transportation will be found in the appendix marked B.

With private transportation of all sorts and descriptions the Department is not interested, except pack-mule transportation. Certain rules govern this kind while in the park, rendered necessary by a due regard to the safety of others traveling in vehicles, as well as the safety of the parties using the pack mules. This is the kind of transportation that is most generally used by hunting parties in the fall of the year, wishing to go through the park and hunt in the country south, southeast, and southwest of the park. Such transportation is restricted to the conditions of traveling on the usually traveled roads and leading the pack animals, for the reasons given above. When the party is under the control of a registered guide a greater latitude is allowed to the routes taken through the park, and a guide is only registered when he is personally known to be absolutely competent and reliable. A list of these registered guides will be found in the appendix marked C.

The Monida and Yellowstone Stage Company have seemingly absorbed the business previously conducted by Mr. C. J. Bassett, from Beaver Canyon, Idaho, into the park via the western entrance, as I have no reports of any passengers by his line during the past season, nor has he applied for license to conduct this class of business.

CARRYING FIREARMS THROUGH THE PARK.

The custom of carrying firearms of some description is nearly universal among the citizens of States bordering the park, who travel in their own conveyances, or on saddle animals; and of course those desiring to hunt in the country adjacent to the park, and who go through the park either on starting on their trip or returning, are fully equipped in this particular. With reference to all of these individuals, the regulation prohibiting firearms in the park, except on written permission from the acting superintendent, in which case the arms are sealed, has been strictly enforced. It is a wise regulation, and its enforcement is essential to the protection of the park.

The mere fact that this region has been set aside as a national park engenders a feeling of hostility toward it and toward the authorities here, on the part of the people living nearest to it; and the fact that it abounds in game, which is becoming more and more rare in other parts of the United States, intensifies the feeling of enmity. As the benefits to the people of the surrounding country derived from keeping the park intact and the game protected become better understood by them, this hostility will undoubtedly cease; and in performing the duties of acting superintendent I have endeavored to make this plain to all I have been brought in contact with, and, so far as possible, to make them friends of the park.

LEASES.

There has been no intentional violation of terms and conditions of any lease during the past year. The rentals under these leases are paid direct to the Department in Washington, except that of Mrs. Jennie H. Ash, which was forwarded through this office under date of August 9, 1898, and its receipt duly acknowledged.

The Monida and Yellowstone Stage Company have constructed on sites selected by me, three neat barns, holding from 8 to 12 horses (one at Upper Geyser Basin, 8 horses; one at Norris Geyser Basin, 12 horses; one at Mammoth Hot Springs, 12 horses), with additions for grain and sleeping quarters for drivers and stock tenders.

At the Fountain, Lake, and Grand Canyon they have used the barns of the Yellowstone Park Association; having made such arrangements until locations are made and permanent barns constructed.

The railway station of this line is Monida, on the Oregon Short Line, 60 miles west from the west entrance to the park ("Dwelles").

Between Dwelles and Monida is operated a daily relay line, and in use on this daily are 32 horses and 2 extra coaches. These extra coaches have been kept at Monida in case more tourists applied than could be accommodated by the daily.

At Dwelles are kept 7 coaches and 3 surreys, with drivers and teams, for park service. At Norris are kept 1 coach and 1 surrey to accommodate tourists holding Northern Pacific tickets, "Norris to Monida", who have made the regular park trip and are ticketed out via Monida. These are picked up at Norris, taken to Dwelles for the night, and then take the daily to Monida the following day.

A barn has been constructed at Monida that will accommodate 20 horses, and wagon sheds to accommodate the entire outfit. Wagons, harness, and equipment will be placed in the Monida barn for the winter and \$20,000 insurance placed on same. Horses will be wintered in the lower Centennial Valley.

Stations have been constructed at Reeds, Red Rock Pass (Klondyke), and at Dwelles. A wagon bridge has been constructed by this company over the south fork of the Madison River, costing \$75; approaches have been built to the Snake River ford, and a crew of 3 men and 1 team have been employed for two months, keeping the road free of rock and in repair.

Madison County appropriated \$500, which was expended in addition upon the road between Monida and Dwelles. This road is now far better than the ordinary country road, and is nearly as good as the roads within the park. I append stage schedule of this company (Appendix G). The plats of the various sites granted under and required by lease from the Department to this company will be forwarded as soon as completed.

The building of Mr. H. E. Klamer, at Upper Geyser Basin, referred to in last year's report as not being then received, has been completed and received. A list of leases now held in the park is hereto appended (Appendix D).

UNITED STATES COMMISSIONER AND HIS WORK.

The presence of a United States commissioner at Mammoth Hot Springs to hear and determine cases of violations of the park laws and regulations is eminently satisfactory, and continues to do much to prevent these violations. I append herewith a report of persons tried by him (Appendix E).

FIRES.

The park has been exceptionally exempt from forest fires this year, due not only to the thoroughness with which the patrol work was done, but also to the growing carefulness in reference to fires exercised by camping parties and others. On August 8 a fire was reported 9 miles

northwest of Riverside Station, a short distance outside the park limits, but as the direction of the prevailing wind would soon bring it within the park, a detail of officers and men were sent, and after two days of much fatigue and hard work it was brought under control.

On August 26 a fire was reported and located between Barlow's Fork and Heart River in the southeastern portion of the park, but fortunately rain followed for several days, extinguishing it and rendering no work on the part of the troops necessary, other than a careful watch for several days. The causes of neither of these fires could be definitely determined, but that of August 26 unquestionably originated from camp fires carelessly left burning or smoldering. The origin of the fire of August 8 was not so plainly accidental, and the inquiry as to its origin was limited to the determination that its starting point was not within the park limits. It ought not to be difficult for campers in and in the vicinity of the park to understand the incalculable damage, both in the present and for future years, that can be done by not carefully complying with the park laws in this respect.

FOREST RESERVES.

Bordering on the eastern and southern limits of the park are two forest reserves, both of which have been recommended by my predecessor to be brought within the park boundaries and made a part thereof. It will be remembered that these tracts of land were set aside and established as a public reservation by proclamation of the President, made on March 30 and September 10, 1891, and though not coming within the provisions of the act of Congress approved May 7, 1894, are yet under the jurisdiction and control of the acting superintendent and the military force in the park for the enforcement of the law setting them aside, especially relating to the preservation of the game. To thoroughly determine the character of the forest reserve on the east, the settlers therein, game, etc., Lieutenant Lindsley, Fourth Cavalry, was sent to investigate the same, and on his return submitted a report which will be found in the appendix (F). It will be seen that there are many settlers in it, some in violation of law, and that a few mining claims are being worked.

The country does not seem to be the habitat of any large quantity of game. The forest reserve on the south contains no settlers, is of no mineral value, and is unquestionably a game country. I would for these reasons, therefore, urge that the forest reserve on the south be made a part of the park, and the forest reserve on the east be not further considered with this end in view. It is probable that whatever opposition has hitherto been encountered in taking in both of these reserves as part of the park would cease, when it is proposed to take in only that one on the south, which possesses only the advantage of being a great game country, and has no mineral or agricultural advantage to settlers. I would also recommend that the necessary legislation be enacted, bringing the forest reserves bordering the park under the provision of the National Park protective act, approved May 7, 1894, to preserve and protect the game. As is set forth in the notice of the Department, which has been placed in conspicuous places in and about the park, "All persons are warned not to hunt nor kill game thereon", and the penalty for doing this is ejection from the reserve, prosecution for trespass, and the holding of such persons pecuniarily responsible for any waste or damage, whether done intentionally or

caused by neglect. Such is the extent of the punishment, and in its present mild form it does not form a sufficient safeguard for the protection of the reserve and its game.

PROTECTION.

The following animals are found in the park:

Antelope.—These are yet numerous. The snow drives them from the mountains and high plateaus, their feeding and breeding ground in spring and summer, to the lower altitudes outside of the park, where many are killed.

Bear.—Plentiful, and have proved destructive to the stores of the detachments on station, lunch stations, and campers. If they continue to increase in the future as in the past, some means will have to be taken to rid the park of the yearly increase. They are numerous at the garbage piles of the hotels, and are objects of much interest and enjoyment to the tourists.

Buffalo.—There are probably 50 of these animals yet in the park. They are not increasing—due, I believe, to too much inbreeding. This is about the only wild herd in the United States, and steps should be taken to prevent the extermination of this herd from the evils of inbreeding by the purchase of a few good bulls. Full and ample protection is given these animals, and I believe that with new stock introduced into the herd, an increase would follow.

Coyotes.—Very numerous in certain sections. They do some damage to the young elk, but the young deer and antelope are their particular prey. Efforts are made in winter to keep their number down by poisoning carcasses of dead animals, and to a certain extent it has been successful.

Deer.—Numerous, on the increase; and the protection afforded them has done much to make them very tame. They are frequently seen by tourists along the usually traveled route.

Elk.—Numerous, and are increasing. The park is their breeding place in spring, and feeding ground in winter. Immense herds can be seen in nearly any direction in winter, and in certain localities in summer.

Fur-bearing animals.—Beaver, more plentiful than ever before, and their locations in the various streams in the park are carefully watched and protected. Numerous new dams have been constructed. Otter are fairly abundant. Martens are plentiful and widely distributed as are also the Canadian lynx, wild-cat, and mink. Foxes are in goodly number, the black and red being frequently seen, and some timber foxes being reported. There are also some badgers, and a great many muskrats, ground hogs, squirrels, chipmunks, skunks, porcupines, and rabbits. Of the latter there are the cottontails, a few jack-rabbits, many snowshoe rabbits, and the paca, the tiny rock rabbit. All these animals are increasing yearly.

Moose.—Quite numerous in the south and southwestern portions of the park and forest reserve, and are apparently increasing.

Sheep.—In considerable numbers in various sections of the park; especially are they conspicuous in winter, when they leave the higher peaks and seek a somewhat lower level to feed, and later on to breed. I believe their number is increasing.

Wolverines.—While not plentiful are distributed over a large area of the park.

BIRDS.

Pelicans, geese, ducks, gulls, cranes, swans, ospreys, hawks, eagles, grouse, jays of all kinds, water ousel, robins, kingfishers, and various other small birds abound in the park. The aquatic birds nest here and remain here until late in the fall, and, it is probable, during the winter in streams and lakes where the hot springs prevent entire freezing of the water.

As already stated, at the opening of the winter there was but a balance of \$66.01 remaining on hand for both the protection and improvement. Using this until exhausted, and relying upon the untiring efforts and conscientious work of Lieutenant Lindsley, soldiers, and a volunteer scout, the protection of the park was as efficiently performed, if not to a greater extent, than in former years. The plan adopted was to ascertain the location of all persons who in past years have been guilty, or thought guilty of poaching, and never let them get beyond the surveillance of the park authorities. This was successfully done in many cases, and resulted in the capture and trial of some of them by the United States commissioner; and, with the assistance of the State authorities, by the civil courts, thus deterring others from attempting to poach. Unless actually taking part in the winter work here, the hardships are inconceivable, and I forward herewith as an appendix the report of these trips made by scouts and others, showing the work done. It represents miles of snowshoeing, embracing all portions of the park, under all sorts of weather and temperature, where the parties were their own pack animals, camping usually where night found them, or resorting to the snowshoe shacks, affording but little protection.

The Department supplied sleeping bags, which are of incalculable comfort; and before the winter sets in, comfortable cabins will be built at necessary and convenient points, stocked with rations and bedding, and having stoves, which will lessen materially the hardships and discomforts of these trips. With the end in view of having transportation of some sort for necessary articles for these winter scouting parties, I believed that the reindeer recently purchased by the Government for the Klondike relief party, which was subsequently abandoned, could be used to advantage, and accordingly addressed a letter to the Department asking, if practicable, that a few be sent here for this purpose. It is unfortunate that these animals were so located that they could not be sent here, for in the use of these animals or in sledge dogs lies the solution of winter work in the park.

FISH.

Many streams and lakes were stocked in 1889, 1890, 1893, and 1895, have multiplied abundantly, and in spite of the enormous quantity caught yearly, and those destroyed by animals and birds, there is apparently an ample quantity yet in all the streams. I endeavored to have a hatchery established in the park, believing this to be the most appropriate and suitable place in the United States, as this is the reservoir drained by the principal rivers of the Atlantic and Pacific oceans, and fish planted in these streams would, with natural conditions fulfilled, soon fill the streams outside the park, but the United States Fish Commission did not deem it advisable. Later on this year, it is my intention to determine if the lake bass planted in certain lakes in the

park have survived; none as yet have been caught, and it is possible that they may have perished for want of proper food. There are certain waters in the park that will afford ample food for them, and, if possible, these waters will be stocked. There is no finer trout fishing in the world than that of the waters of the park, and it is free to all.

From the above it will be seen that the park as a game and fish preserve has not its equal in the world; the variety is great, and it is eminently fitted to sustain this variety under the protection of the Government. An increase in appropriation means an increase in the means and facilities of protection, and as a national game preserve, which not only holds secure the remaining wild animals and game birds of this country, but enables them to breed and multiply, thus supplying the needs of neighboring States, it is deserving of an increased fund for this purpose. This leaves out entirely its charm as a pleasure ground for the tourist, with its wonderful natural phenomena. To maintain both of these conditions there is but one inadequate appropriation for the park, viz, that for its protection and improvement.

IMPROVEMENT.

Nature can not be improved upon; the wise policy for years held by the various acting superintendents, has resulted in the laying out of roads interfering the least with natural conditions, and affording the sight-seer with the easiest, most direct, and at the same time safest routes to those wonderful sights which nature has lavishly worked in the park. This work is not yet completed, and some of the grandest scenery and phenomena in the park are yet unseen by the great majority of visitors, on account of lack of means to construct these safe and convenient roads. The first work in the spring, previous to June 1, at which date the stages begin their summer travel, is to send a crew over all the roads, shoveling out snow yet remaining in deep drifts in many places, removing fallen timber, repairing the roads, and making them safe and fit for traveling. As stated before in this report, there were absolutely no funds on hand for this work at the opening of the present season, but with the aid of the scouts and soldiers the roads were opened up, and put in fit condition for travel, and no delay was caused to the tourists.

As is well known, the present traveled route carries the tourist from Cinnabar, via Mammoth Hot Springs, Norris Geyser Basin, Lower Geyser Basin, Upper Geyser Basin, Lake, Canyon, and again to Norris, Mammoth Hot Springs, to Cinnabar; or, arriving at Monida, he enters the park on its western boundary at Riverside, thence to Lower Geyser Basin, and with the exception of the ride from Mammoth Hot Springs to Cinnabar, his route is as above, returning to Monida via Riverside. It is thus seen that 28 miles in one case, and 42 miles in the other is gone over twice, which is objectionable. This can be avoided by the construction of a road from the canyon northward, following the canyon of the Yellowstone River over Mount Washburn, and thence by way of Tower Creek into Yancey's, and thence into the Mammoth Hot Springs.

There are at present two trails leading from the canyon to Yancey's over Mount Washburn, joining about a mile and a half south of Tower Creek. I have been over both of these trails, examining each carefully, both for scenic effect and practicability for road construction, and on both these grounds am thoroughly satisfied that the eastern (or lower) trail is the route to be followed in constructing this road, which will be

about 23 miles long, and can be built for \$45,000. From Yancey's to Mammoth Hot Springs is 20 miles. Some 4 or 5 miles of the most costly part of this road was built last year, and has been kept in thoroughly first-class condition, leaving some 15 miles to construct, costing about \$15,000. It is recommended that this amount (\$60,000) be appropriated for this specific purpose, in addition to the usual annual appropriation for the protection and improvement of the park.

The monthly reports of work done in the improvement of the park have given in detail what has been accomplished the past summer, and the further projected improvement in roads already constructed, as set forth in project submitted at the time the appropriation became available, will be completed before the close of the season.

This will be done within the limits of the appropriation, still keeping sufficient on hand for the protection of the park during the eight months of winter, and for opening the roads for tourist travel beginning on the 1st of next June. Taking out of the appropriation for this year of \$40,000 the smallest necessary amount for protection (\$3,000), there remains but \$37,000 with which to do this work. And when it is remembered there is 170 miles of constructed road which has to be gone over entirely at the commencement of every season, kept in repair for four months of the year, and then put in the best possible shape to withstand the effects of winter, it must be confessed that \$218 is but a scant allowance for each mile of road. I have not the data available to make the comparison, but I doubt if there is any road in the country which is traveled so much by the public, demanding a good road, which costs so little per mile. Here is also seen the impossibility of yielding to the demands of the tourists for more new roads leading to places of interest and beauty reached now only by trails, and not to be carried over twice some portion of the route now used. The amount now appropriated is the smallest amount with which the protection and present road condition in the park can be maintained, and if Congress intends to ratify and make good its dedication of the park to the people of the United States as a pleasuring ground for its benefit and enjoyment, it should yield to the demands of the people and make additional appropriation for the construction of new roads, which will add to their pleasure and benefit by opening new and wonderful phenomena and scenery.

NATURAL PHENOMENA OF THE PARK.

There does not seem to be any material change in these during the past year. Certain geysers and hot springs are noted as having become extinct, and others which were quiescent have again become active. The geysers which can be depended upon for regular displays are few in numbers, but constant observation of nearly all of them has enabled their time of eruption to be determined with sufficient accuracy to inform tourists, and give them an opportunity to witness their marvelous displays. There is unquestionably a close connection between temperature of water in the geyser and its time of eruption, certain geysers erupting when the water in their craters reaches a certain temperature, which varies for each geyser, and with the proper instruments for taking temperatures it will not be difficult to foretell the time of display of those geysers which are of greatest celebrity, and thus afford tourists the opportunity of seeing them. I will, if possible, determine the eruptive temperature of the most important geysers before the next tourist season, and will be enabled to give due notice of their eruption.

Mud Geyser has been exceedingly active for a period of two weeks this summer. It has for some years been a somewhat quiescent, boiling mud pool, but in the latter part of July it became more violent, and soon gave a remarkable display of its powers, throwing immense clots of mud 50 and 100 feet away from its crater. It covered the ground and trees in its vicinity and was in this state of eruption for two weeks. It gradually became quiet, but the contents of its crater have changed from boiling mud to boiling dirty water. The Black Growler, in Norris Basin, has also displayed remarkable activity this summer, and the noise of the escaping steam through its crater could be heard for miles; and at the base a mud spring has broken forth, which apparently seems to be growing larger. The Constant Geyser has within the past three weeks ceased to play, after many years of uninterrupted activity.

A new road, now completed, between Elk Park and Gibbon Meadow, on the road from Norris to Fountain, leads past two beautiful chocolate-colored geysers situated on opposite sides of the Gibbon River. They are immense cones. From the top of each a goodly stream of water continually boils and is ejected some feet in the air. The cascades and rapids along the road, which follows the river, are exceedingly picturesque and beautiful.

I forward herewith a map of the park and forest reserve, the same that accompanied the report of last year of the acting superintendent. Upon this I have marked the changes in road system of the park. They are as follows:

Main traveled road, cut off Elk Park to Gibbon Meadow, now notated as completed and used by park transportation companies; road along Madison River from falls of the Firehole River to boundaries of park completed and used by the Monida and Yellowstone Stage Company; road from Upper Geyser Basin to Lone Star Geyser, notated as being used by the same company; projected road from Canyon Hotel to Yancey's, notated so as to show the lower (or eastern) trail as the one recommended to be built, instead of the upper (or western) trail as shown on the map.

My efforts to preserve and maintain the park intact, and for its protection and improvement have been ably seconded by all officers of this command.

Supplementary reports will be submitted at the close of the season, when the weather prevents further work on the roads, and at such times during the coming winter as will keep the Department fully informed of the condition of affairs in the park.

I submit herewith the meteorological record as kept at Fort Yellowstone by the post surgeon.

Very respectfully,

JAMES B. ERWIN,
Captain, Fourth Cavalry, Acting Superintendent.

The SECRETARY OF THE INTERIOR,
Washington, D. C.

APPENDIX A.

RULES AND REGULATIONS OF THE YELLOWSTONE NATIONAL PARK.

DEPARTMENT OF THE INTERIOR,
Washington, D. C., June 1, 1897.

The following rules and regulations for the government of the Yellowstone National Park are hereby established and made public pursuant to authority conferred by section 2475, Revised Statutes United States, and the act of Congress approved May 7, 1894:

1. It is forbidden to remove or injure the sediments or incrustations around the geysers, hot springs, or steam vents; or to deface the same by written inscription or otherwise; or to throw any substance into the springs or geyser vents; or to injure or disturb in any manner, or to carry off any of the mineral deposits, specimens, natural curiosities, or wonders within the park.

2. It is forbidden to ride or drive upon any of the geyser or hot spring formations or to turn loose stock to graze in their vicinity.

3. It is forbidden to cut or injure any growing timber. Camping parties will be allowed to use dead or fallen timber for fuel.

4. Fires shall be lighted only when necessary, and completely extinguished when not longer required. The utmost care should be exercised at all times to avoid setting fire to the timber and grass, and anyone failing to comply therewith shall be peremptorily removed from the park.

5. Hunting or killing, wounding or capturing, of any bird or wild animal, except dangerous animals, when necessary to prevent them from destroying life or inflicting an injury, is prohibited. The outfit, including guns, traps, teams, horses, or means of transportation used by persons engaged in hunting, killing, trapping, ensnaring, or capturing such birds or wild animals, or in possession of game killed in the park under other circumstances than prescribed above, will be forfeited to the United States, except in cases where it is shown by satisfactory evidence that the outfit is not the property of the person or persons violating this regulation and the actual owner thereof was not a party to such violation. Firearms will only be permitted in the park on written permission from the superintendent thereof. On arrival at the first station of the park guard, parties having firearms will turn them over to the sergeant in charge of the station, taking his receipt for them. They will be returned to the owners on leaving the park.

6. Fishing with nets, seines, traps, or by the use of drugs or explosives, or in any other way than with hook and line, is prohibited. Fishing for purposes of merchandise or profit is forbidden by law. Fishing may be prohibited by order of the superintendent of the park in any of the waters of the park, or limited therein to any specified season of the year, until otherwise ordered by the Secretary of the Interior.

7. No person will be permitted to reside permanently or to engage in any business in the park without permission, in writing, from the Department of the Interior. The superintendent may grant authority to competent persons to act as guides and revoke the same in his discretion, and no pack trains shall be allowed in the park unless in charge of a duly registered guide.

8. The herding or grading of loose stock or cattle of any kind within the park, as well as the driving of such stock or cattle over the roads of the park, is strictly forbidden, except in such cases where authority therefor is granted by the Secretary of the Interior.

9. No drinking saloon or bar room will be permitted within the limits of the park.

10. Private notices or advertisements shall not be posted or displayed within the park, except such as may be necessary for the convenience and guidance of the public, upon buildings on leased ground.

11. Persons who render themselves obnoxious by disorderly conduct or bad behavior, or who violate any of the foregoing rules, will be summarily removed from the park, and will not be allowed to return without permission, in writing, from the Secretary of the Interior or the superintendent of the park.

Any person who violates any of the foregoing regulations will be deemed guilty of a misdemeanor, and be subjected to a fine as provided by the act of Congress approved May 7, 1894, "to protect the birds and animals in Yellowstone National Park and to punish crimes in said park, and for other purposes," of not more than \$1,000 or imprisonment not exceeding two years, or both, and be adjudged to pay all costs of the proceedings.

CORNELIUS N. BLISS,
Secretary of the Interior.

INSTRUCTIONS TO PERSONS TRAVELING THROUGH YELLOWSTONE NATIONAL PARK.

DEPARTMENT OF THE INTERIOR,
OFFICE OF SUPERINTENDENT OF YELLOWSTONE NATIONAL PARK,
Mammoth Hot Springs, Wyo., June 20, 1897.

The following instructions, for the information and guidance of parties traveling through the Yellowstone Park, having received the approval of the Secretary of the Interior, are published for the benefit of all concerned.

(1) *Fires*.—The greatest care must be exercised to insure the complete extinction of all camp fires before they are abandoned. All ashes and unburned bits of wood must, when practicable, be thoroughly soaked with water. Where fires are built in the neighborhood of decayed logs particular attention must be directed to the extinguishment of fires in the decaying mold. Such material frequently smolders for days and then breaks out into dangerous conflagration. Fire may also be extinguished, where water is not available, by a complete covering of earth, well packed down.

(2) *Camps*.—No camp will be made at a less distance than 100 feet from any traveled road. Blankets, clothing, hammocks, or any other article liable to frighten teams must not be hung at a nearer distance than this to the road. The same rule applies to temporary stops, such as for feeding horses or for taking luncheon.

Camp grounds must be thoroughly cleaned before they are abandoned, and such articles as tin cans, bottles, cast-off clothing, and other debris must be either buried or taken to some place where they will not offend the sight.

(3) *Bicycles*.—Many of the horses driven in the park are unused to bicycles and liable to be frightened by them. The greatest care must, therefore, be exercised by their riders. In meeting teams, riders will always dismount and stand at the side of the road—the lower side if the meeting be on a grade. In passing teams from the rear, riders will ring their bells as a warning and inquire of the driver if they may pass. If it appear from the answer that the team is liable to be frightened, they may ask the driver to halt his team and allow them to dismount and walk past.

Riders of bicycles are responsible for all damages caused by failure to properly observe these instructions.

(4) *Fishing*.—All fish less than 6 inches in length should at once be returned to the water with the least damage possible to the fish. No fish should be caught in excess of the number needed for food.

(5) *Dogs*.—When dogs are taken through the park they must be prevented from chasing the animals and birds or annoying passers-by. To this end they must be carried in the wagons or led behind them while traveling, and kept within the limits of the camps when halted. Any dog found at large in disregard of this section will be killed.

(6) *Grazing animals*.—Only animals actually in use for purposes of transportation through the park can be grazed in the vicinity of the camps. They will not be allowed to run over any of the formations, nor near to any of the geysers or hot springs; neither will they be allowed to run loose in the roads.

(7) *Miscellaneous*.—The carving or writing of names or other things on any of the mileposts or signboards, or any of the seats, railings, or other structures, or on the trees, will not be permitted.

Persons are not allowed to bathe near any of the regularly traveled roads in the park without suitable bathing clothes.

(8) Willful disregard of these instructions will result in the ejection of the offending person or persons from the park.

JAMES B. ERWIN,
Captain, Fourth Cavalry,
Acting Superintendent of the Yellowstone National Park.

INSTRUCTIONS FOR STATIONS, MAY, 1898.

OFFICE OF SUPERINTENDENT YELLOWSTONE NATIONAL PARK,
Mammoth Hot Springs, Wyo., May 30, 1898.

GENERAL INSTRUCTIONS.

It is the duty of the stations to see that all the rules and regulations and the instructions to persons traveling through the park are complied with. Parties violating any of these rules or instructions will be promptly placed under arrest and reported to headquarters. If the station is not in telegraphic communication with headquarters the offending persons may be brought in to the nearest telegraph station, where report of the case will be promptly made. Frequent patrols will be

made into all the territory belonging to the station for the observation and protection of the game and forests. Particular attention will be paid to the prevention and extinguishing of fires, and when any fire is discovered that can not be controlled by the station an immediate report will be made to headquarters.

When the country is so dry that there is danger of fires along the road, the road will be patrolled every morning.

Each noncommissioned officer will be held responsible for the proper policing of his station and of the ground in its vicinity, and all men on station must, except when scouting, wear the proper uniform and must always be neat and clean. All refuse and slops from camp will be buried.

One man must always be left at the station.

Persons carrying firearms or traps through the park must always have a written permit. This permit must be presented at each station passed and must be carefully scrutinized by the man in charge of the station at the time. If it appears that no undue advantage has been taken of the permit, and if the seals are intact and secure, the permit will be indorsed on the back. If the bearer of the permit appears to have violated the conditions thereof, to have unreasonably delayed between stations, he will be held and the case reported at once to the acting superintendent.

Pack trains entering the park may be given a permit by the noncommissioned officer in charge of a station to come in, traveling by wagon roads only, to the nearest station on their route where there is a commissioned officer. Pack trains will not be allowed off the wagon road without permission in writing from a commissioned officer. Persons in charge of pack trains will be instructed that all vehicles have the right of way over pack trains, and that they will be held responsible for interfering with the progress of wagons or frightening their horses.

All noncommissioned officers in charge of stations will send in to the quartermaster on the 15th and last days of each month all receipts for forage furnished and to their troop commander all receipts for meals.

All stations where a register is kept will forward with their report at the end of each month the number of persons who have been registered during the month. The exterior stations will give the number entering and the number leaving the park by their station. Transcript from register of camping parties will not be sent in.

JAMES B. ERWIN,

Captain, Fourth Cavalry, Acting Superintendent.

SPECIAL INSTRUCTIONS.

Norris.—The territory belonging to this station in summer is that drained by Solfatara Creek, the Gibbon from the head of Virginia meadows to the head of the Gibbon Canyon, Obsidian Creek to the Crystal Springs, and by Straight and Winter creeks.

Road patrols will extend to the Crystal Springs and 5 miles towards the canyon.

This station is charged with the protection of the Norris Basin, and from the time when the first coaches come in until the last one has left one man must remain on the formation. A man must also be on the formation whenever camping parties are there.

The beaver in the neighboring streams must be carefully watched, the same as in winter.

Grand Canyon.—The territory includes the headwaters of the Gibbon to Virginia Meadows and all the country that drains into the Yellowstone from the Mud Geyser to and including Tower Creek. The beaver in Cascade Creek and lake must be carefully watched. Road patrols will extend 6 miles towards Norris and to the Mud Geyser.

Lake.—The territory includes all the country draining into the Yellowstone River, above Mud Geyser, and all draining into the lake from Beaverdam Creek to Rocky Point. Road patrols will extend from Mud Geyser to 10-mile post towards the Thumb.

All parties passing this station will be registered in the book provided for that purpose.

Upper Basin.—The territory includes all the country that drains into Shoshone Lake from DeLacey Creek to its outlet on the west; all the country that drains into the Firehole River to a point opposite the 5-mile post towards Fountain.

Road patrols will extend 9 miles towards the Thumb and 5 miles towards the Fountain.

A principal and very important duty of this station is to protect the formation from injury or defacement.

All parties who camp at or in the vicinity of the Upper Basin will be registered in the book provided for that purpose.

Thumb.—The territory includes all the country that drains into the lake from Rock Point to Beaverdam Creek; also the country that drains into Shoshone Lake from DeLacey Creek to its outlet into Lewis River above the falls, and into Heart Lake. While tourists are at the Thumb, one man will be kept on the formation to enforce the regulations.

Road patrols will extend 9 miles towards the Lake Hotel, 10 miles towards the Upper Basin, and to Lewis Falls.

JAMES B. ERWIN,
Captain, Fourth Cavalry, Acting Superintendent.

OFFICE OF SUPERINTENDENT YELLOWSTONE NATIONAL PARK,
Mammoth Hot Springs, Wyo., May 30, 1898.

SPECIAL INSTRUCTIONS.

Parties carrying firearms or traps and desiring to enter the park will be closely questioned as to their intentions and purposes. If they intend to leave the park by the same station by which they entered, they will be required to leave their arms at the station. A receipt will be given, and the arms will be cared for and returned to the owners on their exit from the park.

If the parties desire to pass through the park and leave by some other station, the noncommissioned officer will, if he is satisfied that they are reliable parties, seal their guns and issue a permit on the blank forms provided for that purpose. He will instruct the holder of the permit that he must present it at every station he passes for examination and indorsement, and that any violation of the terms of permit or any undue advantage taken of it will result in his arrest and trial.

When parties leave the park, the permit will be taken up by the last station along the route. It will be properly indorsed and sent to headquarters at the end of the month.

The seals will be removed from the guns when permit is taken up.

JAMES B. ERWIN,
Captain, Fourth Cavalry, Acting Superintendent.

APPENDIX B.

List of parties holding license to conduct camping business.

No.	Name.	Residence.	Number of vehicles.	Duration.
1	G. W. Torbert	Cinnabar, Mont.	4	May 26 to Oct. 1, 1898.
2	W. E. Knowles and H. M. Gore .....	.....do	5	May 27 to Oct. 1, 1898.
3	W. S. Dixon	Livingston, Mont.	3	May 28 to Oct. 1, 1898.
4	Charlie T. Smith .....	.....do	3	Do.
5	Alfred Lycan	Bozeman, Mont.	5	Do.
6	W. J. Kupper	Cinnabar, Mont.	4	May 30 to Oct. 1, 1898.
7	Adam Gassert .....	.....do	5	June 6 to Oct. 1, 1898.
8	S. M. Fitzgerald	Gardiner, Mont.	5	Do.
9	B. S. Thresher and O. L. Bishop	Butte, Mont.	5	June 16 to Oct. 1, 1898.
10	A. L. Roseborough	Gardiner, Mont.	4	June 27 to Oct. 1, 1898.
11	Marshall Bros	Livingston, Mont.	5	June 30 to Oct. 1, 1898.
12	F. V. Blankenship	Bozeman, Mont.	5	Do.
13	A. W. Chadbourne	Cinnabar, Mont.	5	July 7 to Oct. 1, 1898.
14	Shaw & Powell	Livingston, Mont.	4	Aug. 1 to Oct. 1, 1898.
15	A. D. Creasey	Bozeman, Mont.	3	Aug. 9 to Oct. 1, 1898.
16	Wm. Wells	Wells P. O., Wyo.	2	Sept. 8 to Oct. 1, 1898.
17	G. W. Wakefield	Livingston, Mont.	2	Sept. 13 to Oct. 1, 1898.

APPENDIX C.

List of registered guides.

No.	Guide.	Residence.	Number of animals.	Duration.
1	William Hague.....	Fridley, Mont.....	20	May 31 to Dec. 31, 1898.
2	Richard Randall.....	Gardiner, Mont.....	20	July 13 to Dec. 31, 1898.
3	Henry George.....	Cinnabar, Mont.....	20	Do.
4	John P. Bean.....	Bozeman, Mont.....	20	July 16 to Dec. 31, 1898.
5	James H. Tappan.....	Dubola, Wyo.....	20	July 17 to Dec. 31, 1898.
6	Taswell Woody.....	Pleasant Valley, Y. N. P.....	30	July 19 to Dec. 31, 1898.
7	Burton Harris.....	Elk P. O., Wyo.....	15	July 20 to Dec. 31, 1898.
8	Oliver Paulsell.....	Red Lodge, Mont.....	10	July 25 to Aug. 15, 1898.
9	W. T. Hall.....	Gardiner, Mont.....	16	July 26 to Dec. 31, 1898.
10	Geo. W. Reese.....	Cinnabar, Mont.....	20	Aug. 6 to Dec. 31, 1898.
11	Elwood Hofer.....	Gardiner, Mont.....	40	Aug. 10 to Dec. 31, 1898.
12	W. T. Hall.....	do.....	40	Do.
13	Frank Randall.....	do.....	10	Aug. 22 to Oct. 30, 1898.
14	Geo. Albert Mohl.....	Fridley, Mont.....	16	Aug. 23 to Oct. 31, 1898.
15	O. Paulsell.....	Red Lodge, Mont.....	10	Aug. 23 to Sept. 15, 1898.
16	B. D. Sheffield.....	Livingston, Mont.....	30	Aug. 23 to Dec. 31, 1898.
17	Frank M. Scott.....	Gardiner, Mont.....	15	Aug. 25 to Oct. 31, 1898.
18	Henry Kitchens.....	Absarokee, Mont.....	12	Aug. 29 to Oct. 31, 1898.
19	William Nichols.....	Cooke City, Mont.....	13	Do.
20	David Black.....	Chico, Mont.....	12	Aug. 31 to Nov. 30, 1898.
21	Fountain Black.....	do.....	12	Do.
22	Wm. A. Donahoe.....	Gardiner, Mont.....	13	Sept. 1 to Oct. 15, 1898.
23	Wm. Wells.....	Wells P. O., Wyo.....	20	Sept. 3 to Dec. 31, 1898.

APPENDIX D.

LEASES IN YELLOWSTONE NATIONAL PARK.

Yellowstone Park Transportation Company: Mammoth Hot Springs, 2 acres; Norris, 2 acres; Fountain, 1 acre; Upper Geyser Basin, 2 acres; Lake, 2 acres; Canyon, 1 acre, building, etc., for the accommodation of employees and stock.

Yellowstone Park Association: Mammoth Hot Springs, Mammoth Hotel and commissary; Mammoth Hot Springs, Cottage Hotel and Mammoth Barn; Fountain (Lower Basin), cottages; Fountain, Fountain Hotel and barn; Lake, Lake Hotel and barn; Canyon, Canyon Hotel, pump house, and barn; Upper Geyser Basin, hotel and barn (not yet constructed).

Yellowstone Lake Boat Company: Near Lake Hotel, 2 acres; Frank Island, 2 acres; Stevensons Island, 2 acres; Dot Island, 1 acre; West Thumb, 1 acre; Ways, 2 acres; Southeast Arm, 2 acres; Dot Island Game Corral, 2 acres; to be located by superintendent, 6 acres.

William W. Humphrey and F. Jay Haynes: At Upper Geyser Basin, Thumb, Lake Outlet, Grand Canyon, Norris Geyser Basin, Mammoth Hot Springs, not to exceed 1 acre at each point; building, etc., for the accommodation of employees and stock. (Assignments not yet made.)

Jennie H. Ash: Mammoth Hot Springs, dwelling, post-office, and store.

Ole A. Anderson: Mammoth Hot Springs, dwelling and store.

John F. Yancy: Pleasant Valley, hotel.

F. J. Haynes: Mammoth Hot Springs, studio; Upper Geyser Basin, studio.

Henry E. Klammer: Upper Geyser Basin, dwelling and store.

APPENDIX E.

Statement of cases brought before Hon. John W. Meldrum, United States commissioner, since the 1st day of November, 1897.

January 11.—United States v. Thomas J. Miner. Charge: Violation of the provisions of the act of Congress approved May 7, 1894, "to protect the birds and animals in Yellowstone National Park, and to punish crimes in said park, and for other purposes." Trial had February 8. Defendant ordered to pay a fine of \$50 and costs.

February 12.—United States v. James Herzer. Charge: Violation of the provisions of the act of Congress approved May 7, 1894. Defendant not yet arrested; could not be found within the district of Wyoming.

June 27.—United States v. James Courtenay and Richard Murray. Charge: Violation of the provisions of the act of Congress approved May 7, 1894. Separate trial of Richard Murray. Defendant fined \$50.

NOTE.—The complaint in this case was filed on the 29th day of October, 1897. Original warrant returned December 18, 1897, "not served." Defendants not found within district of Wyoming. Defendant Murray was brought before the commissioner, by virtue of alias warrant issued June 27. Defendant Courtenay not yet arrested.

July 12.—United States v. A. K. Crawford. Charge: Violation of the provisions of the act of Congress approved May 7, 1894. Defendant not yet arrested; could not be found within the district of Wyoming.

August 26.—United States v. A. V. Scott. Charge: Violation of the provisions of the act of Congress approved May 7, 1894. Defendant ordered to pay a fine of \$25 and costs.

NOTE.—The papers in the cases of United States v. James Herzog and A. K. Crawford, respectively, have been transmitted to the United States attorney for the district of Montana, with request that he cause such action to be taken as will place the defendants within the jurisdiction of the authorities of the district of Wyoming.

APPENDIX F.

REPORT OF LIEUTENANT LINDSLEY, FOURTH CAVALRY, ON TRIP TO THE EASTERN FOREST RESERVE.

FORT YELLOWSTONE, WYO., *August 30, 1898.*

SIR: I have the honor to submit the following report of my trip to the eastern forest reserve.

Pursuant to your verbal instructions, I left this post on Sunday the 7th instant with Private Miller, of D Troop. I had ten days' rations, and took two pack mules. Went over the old stage-robber trail. Saw 22 antelope, including 5 kids, on Black-tail Deer Creek; also saw numerous signs of elk and bear. I camped on the extreme head of Lava Creek.

On the 8th I showed Private Miller the cabin on Lava Creek, came by Grebe Lake, then over to Cascade Lake, and down Cascade Creek to the Canyon, then by the wagon road to Mud Geyser. Saw many tracks of elk and deer. The beaver in Cascade Lake and Creek are undisturbed and are doing new work.

On the morning of the 9th Private Rompre, of H Troop, reported to me from the Lake Station and accompanied me. I crossed the river 6 miles from the Lake Hotel, went up Pelican, and by Turbid Lake, and up Bear Creek to the forks, where I camped. Saw 3 elk on the Pelican and plenty of elk and deer signs all the way. Saw a beaver house in Turbid Lake, but had no time to examine it.

On the 10th I crossed the divide by Jones Pass and camped on Jones Creek, under Silver Tip Peak. Private Rompre returned to his station from Bear Creek. Saw 7 elk and plenty of elk and bear signs.

On the morning of the 11th the mules had gone back on the trail, and I sent Miller back after them and remained in camp all day.

On the 12th I rode to the mouth of Jones Creek and examined the trails up and down the North Fork of Stinking Water River. Saw no sign of horses, except the trail of the party which preceded me over Jones Pass a few days before. They had gone down the river. Saw one deer track on the North Fork. Saw where some one had camped last spring at the mouth of Jones Creek and had smoked an elk. On the way back to camp saw where an elk and a lynx had died last spring, probably a natural death, as no parts of the carcass had been removed. Miller returned at 7 p. m. with the mules, which he had found at the lake.

On the 13th I went down to the Stinking Water and followed up it to the mouth of Torrent Creek and camped. Examined the trail to Lamar River. It has not been used recently.

On the 14th I followed the North Fork to its head and crossed the divide to the head of Galena Creek and down it to the head of Sunlight Creek and camped. On the divide I found some shaft timber cut and piled up ready for use. Also found a cabin, not used recently, which I afterwards learned belongs to a Mr. Hughes. On Galena Creek saw a tunnel and a cabin and stable. At the mouth of Galena Creek is another cabin and a fence across the valley. Both sides of the divide are very steep, and a good trail has been built at considerable expense apparently. On the Sunlight side the trail is dug out of slide rock for a large part of the way and it zigzags down the mountain side at a very practicable grade for pack animals. I found a Mr. Campbell and Mr. Vickers camped at the cabin on Sunlight. Last fall

Mr. Campbell located a claim in the gulch between Dyke and Black mountains and built the cabin and fences. He has now brought Mr. Vickers, of Red Lodge, in to inspect the prospect and test the ore, with an idea of building a smelter in case they have sufficient pay ore to warrant it. They had 24 horses, only six of them packed, and intended to stay a month or more.

The old Frenchman of Snake River fame, De Voe, had just come in from Red Lodge and camped near Vickers and Campbell. He had 6 horses (4 packs) loaded with rations, bear traps, etc.; also had 5 stag and bloodhounds. All the men had rifles. De Voe said he had a prospect on Copper Creek and was going to stay in camp a few days and pack some of his ore in for Mr. Vickers to test. Then he wanted to come through the park and go south into Wyoming for the winter. He said he wintered last winter on Wapiti Creek (Elk Fork he calls it), and trapped some bear this spring. I learned next day that he was never known to prospect; that he did winter on Wapiti Creek, and went out about July 1, through Sunlight, with several heads, and went to Red Lodge. Everyone I saw complains of him and his dogs. They say the dogs kill many elk and run the rest out of the country. I was told by Mr. Green, who lives near the junction of the two forks of Stinking Water, that there were dead elk all along the North Fork and its tributaries, killed last winter by De Voe's dogs.

On the 15th I went down Sunlight to the "Basin" and camped at Tighe's ranch. Remained there on the 16th and saw every ranch and nearly every settler in the reserve. Learned that Mr. Webster, for whom I was looking, has not come in that way.

On the 17th I went on down Sunlight to Dead Indian Creek and up it to near its head.

On the 18th I went down Rattlesnake to the North Fork and camped at Mr. Green's ranch.

On the 19th I crossed over to the South Fork and came up it by Marquette and Ishawood post-offices and camped at Col. W. F. Cody's ranch, at the mouth of Ishawood and close to the Forest Reserve line. At Mr. Green's I learned that no party had gone up the North Fork this year and only the party from the park had come down.

On the 20th I went up the South Fork to Captain Darley's ranch, making the acquaintance of all the settlers on the way.

On the 21st I went on up as far as McLaughlin's ranch (Valley Home). This is the farthest settler up the South Fork except Mr. Davis, whom I met at Captain Darley's. I then returned to Cody's ranch and camped.

On the 22d I came up Ishawood to near its head.

On the 23d I crossed the Ishawood Pass and came down Pass Creek to the Thorofare and down it to the Yellowstone.

On the 24th I came to the mouth of the Upper Yellowstone and camped, and on the 25th came to the Lake Hotel and camped near the station, ferrying my stuff over the river and swimming my stock.

On the 26th I laid over to let my stock rest, and went to the Thumb by boat for my mail. Found the station there in excellent condition as to police and neatness. On returning to Lake, I saw a big volume of smoke rising from behind Flat Mountain, which I reported to the superintendent by wire. In obedience to your telegraphic orders to locate the fire and find out its size, I then went in the Government boat, with Sergeant Welch and Private Montgomery and Mr. Bowers, to the south arm of the lake. We ran on a bar at Frank Island and had to go ashore in a rowboat, which I had procured from Mr. Waters, and out some big levers; then got out, waded on the bar, and pried her off. When we reached the south arm it was too dark to go further, so we camped.

The 27th I climbed on foot to the top of the divide, but could not satisfactorily locate the fire from there, so I put the boat into the Flat Mountain arm, made a landing and we climbed Flat Mountain, but had to go on to within 2 miles of Heart Lake before we could locate the fire, on the point between Barlows Fork and Heart River. It rained very hard in the morning, and when I saw the fire it was smoking but evidently not burning very hard. It was over a mile long, however. We returned to the boat and then to the hotel. It rained very hard this evening.

On the 28th I came from the lake to the Canyon, and on the 29th reached this post, having been out twenty-two days, on ten days' rations, plus what I had bought en route.

I saw several elk tracks on Ishawood, perhaps half a dozen, and on Thorofare and the Yellowstone River and Lake saw plenty of elk signs. Saw several moose tracks along the Upper Yellowstone, Thorofare, and the Lake. The beaver dams in Thorofare are deserted, as they are in Beaverdam and Trappers Creek, and all the creeks. There are some bank beaver in the Yellowstone which have escaped the trappers who despoil the colonies in the smaller streams. This is an ideal moose, elk, and

beaver colony, and if a station were put at the mouth of Thorofare, and that country protected, all the streams would soon fill up with beaver, and the moose would increase.

The necessity for a station there and one on Falls River has long been recognized, and now, with the increase in the troops, it will perhaps be practicable.

I saw no game whatever in the reserve, and, except one deer track and a few elk, saw no game signs except in the Thorofare country.

Following is a list of settlers in Sunlight Basin, within the forest reserve:

Gust Lafond, single, claimed a ranch last fall. There was a cabin on the place; has made no improvements and does not live on his claim; has 6 or 8 head of cattle.

Mrs. Chatfield. Mr. Chatfield located on Sunlight previous to 1891. He died last winter and his widow occupies the place. She has 33 head of cattle and a few horses; has a fair cabin, corrals, and stable, and has a meadow under fence and ditch. Mr. Chatfield also had a number of mining claims in the reserve.

Charles Hoff located previous to 1891; has 9 head of cattle and 20 horses; has comfortable cabin and good corrals and stable; has a meadow under fence and ditch; has no mining claims.

John Hughes has been in the country a long time and has several mines up the creek. Took up a ranch and built a house last winter. Has no cattle; about 25 work horses.

Jack Tighe located his ranch in April, 1891, and left for the winter, coming back in 1892, since when he has resided permanently on his place. Tighe has about 6 head of cattle and a few horses; has a pasture under fence and will turn it into a meadow as soon as he completes his ditch. Has a comfortable cabin and fair sheds and corrals. Is married. Cuts no hay. Works for other people some, in mines.

Williard Ruscher took up claim last year. Has cabin; poor fences; no stock; cuts no hay. Works in mines and on ranches.

Henry Delaney built cabin last winter; single; has no stock and no fence; works for other people.

John R. Painter has family. Came from Philadelphia three years ago. Located last summer close to line of forest reserve. Has two good cabins and good stable. Has nearly completed a good house of peeled logs, two stories, five rooms on ground floor, shingle roof, large windows, matched floor, etc. Has three miles or more of good wire fence around field which he uses now as a pasture. Intends to get water on it next year and then cut hay on it. Has several cattle, horses, and mules. Came here to engage in mining. Mr. Painter has purchased the interests of Messrs. Malin and Pratt, Baronette and Miller, also part of the interests of Mr. Hughes, and has an entire or a controlling interest in some half dozen mines—the Silver Tip, Evening Star, Rainbow, Pilgrim, Novelty, and others. He has expended considerable money in building roads and trails and developing his mines. He told me he has invested about \$25,000 in the forest reserve. He has shipped about 27 tons of ore, which averaged at the smelter \$152 per ton, and is now getting out six cars of ore to ship to Omaha. This ore he packs on mules about 10 or 12 miles to the mouth of Sulphur Creek, then hauls 55 miles in wagons to Red Lodge, whence it goes over the Northern Pacific Railroad to Billings and down the Burlington to Omaha. The cost of working, transporting, and mining the ore he reports to be about \$50, leaving him \$100 per ton profit. He is working several men in the Evening Star at present, besides the men engaged in transporting the ore to the railroad. He intends to put in a stamp mill and concentrator on the Silver Tip property next year.

Following is a list of settlers on Shoshone River, and within the reserve:

A. E. Swanson settled in 1895; fair log house and stable; 3 miles of fence; 1½ miles of ditch; 12 acres hay; 15 in wheat and oats; 4 head of cattle, 20 horses.

W. H. Jordan settled in 1897; has fair log cabin and stable; 2 miles wood fence; 2 miles ditch; cuts 30 tons of hay; 7 acres in grain; 36 cattle and 7 horses.

John Davis settled in May, 1891; log house and 2 stables; 1½ mile fence; ¼ mile ditch; cuts 15 tons hay; 7½ acres grain; 7 cattle, 8 horses; is a Welchman and miner.

Duff Putnam settled in 1896; 1-room cabin; 2 stables; 160 acres under fence; 300 yards ditch; cuts 10 tons hay; 12 head cattle, 4 horses.

Capt. Henry A. C. Darley is an ex-officer of Royal Artillery; bachelor; settled in 1897; has fair 3-room house and fair stable; 1 mile wire fence, 1½ miles wood fence; 1½ miles ditch; cuts 50 tons hay; has small field oats this year; 80 cattle and 30 horses; hunts for sport only; has 2 mining claims.

Mrs. E. C. Brown settled April 21, 1894; has fair cabin, several rooms; old, fair stable; 2 miles wood fence; 1 mile ditch; cuts 30 tons hay; has a little barley; 24 cattle, about 100 horses; her son, Nona Brown, is a professional guide, but disclaims to be a hunter, and his neighbors say he is not a hunter.

E. M. Brown settled April 21, 1894; has fair cabin and stable; 2 miles wood fence; 1 mile ditch; cuts 30 tons hay; has no cattle; 4 horses.

James McLaughlin settled in 1889 or 1890; has 3 good cabins, a stable; about 1 mile good fence; $1\frac{1}{4}$ miles ditch; cuts 40 tons hay, and has a fine vegetable garden; 30 head cattle, 9 horses; is a hunter and trapper, but of late devotes his time to ranching and sometimes guides parties to the park; bears a fine reputation among all his neighbors as being absolutely reliable and honest, intelligent, and industrious.

John Hurst; single; settled in 1894; has a good cabin and corral; no stable; $1\frac{1}{4}$ miles wire fence; $\frac{1}{4}$ mile ditch; cuts 10 tons hay, and has 8 horses; bears a good reputation; Captain Darley gives him a high recommendation as a guide and hunter; is a young man, and seems honest and very intelligent.

Many of these ranches, both on South Fork and on Sunlight, were located and occupied previous to the dates given above, upon which they were first occupied by their present occupants. These two valleys are the only parts of the reserve which are suitable for agriculture or stock raising. In both places stock winters with very little feed and the snow fall is light.

In view of the improvements put there in good faith by settlers, it seems best to me to allow these valleys to be used, as they are of no use as a reserve.

In the Shoshone mining region many claims have been located and represented, some for several years, but no real development work has been done on any of them. In the Sunlight district considerable development has been done, and I would recommend that suitable regulations be promulgated, allowing settlers to use any suitable lands for agricultural and stock-raising purposes, allowing prospecting and mining operations to be carried on, and the necessary amount of timber to be used, under wise regulations which would prevent waste or spoliation of the forests; that the reservation be not added to the park, except such part of it in the south as drains into the Yellowstone River; that the game laws of Wyoming be enforced in the reserve; and that either a detail of soldiers be made to enforce these regulations or that the reserve be placed under charge of proper civil officials for its administration and protection.

Very respectfully,

ELMER LINDSLEY,
First Lieutenant, First Cavalry.

The ACTING SUPERINTENDENT YELLOWSTONE NATIONAL PARK,
Present.

APPENDIX G.

SCHEDULE MONIDA AND YELLOWSTONE STAGE COMPANY.

Both ways via Monida:

First day.—Leave Monida 8.30 a. m., arrive Shambow 12.30 p. m.; leave Shambow 1.30 p. m., arrive Dwelle's 5.30 p. m.

Second day.—Leave Dwelle's 8 a. m., arrive Fountain Hotel 11.30 a. m.

Third day.—Leave Fountain Hotel 8 a. m., arrive Upper Basin 10 a. m.; leave Upper Basin 4.30 p. m., arrive Fountain Hotel 6 p. m.

Fourth day.—Leave Fountain Hotel 7.30 a. m., arrive West Bay 1 p. m.; leave West Bay 3 p. m., arrive Lake Hotel 5 p. m.

Fifth day.—Leave Lake Hotel 9 a. m., arrive Canyon Hotel 12 noon.

Sixth day.—Leave Canyon Hotel 9.30 a. m., arrive Norris 12 noon; leave Norris 1.30 p. m., arrive Mammoth Springs 4 p. m.

Seventh day.—Leave Mammoth Springs 8 a. m., arrive Norris 12 noon; leave Norris 1.30 p. m., arrive Dwelle's 5.30 p. m.

Eighth day.—Leave Dwelle's 8 a. m., arrive Shambow 12 noon; leave Shambow 1 p. m., arrive Monida 6 p. m.

In Monida and out via Cinnabar:

First day.—Leave Monida 8.30 a. m., arrive Shambow 12.30 p. m.; leave Shambow 1.30 p. m., arrive Dwelle's 5.30 p. m.

Second day.—Leave Dwelle's 8 a. m., arrive Fountain Hotel 11.30 a. m.

Third day.—Leave Fountain Hotel 8 a. m., arrive Upper Basin 10 a. m.; leave Upper Basin 4.30 p. m., arrive Fountain Hotel 6 p. m.

Fourth day.—Leave Fountain Hotel 7.30 a. m., arrive West Bay 1 p. m.; leave West Bay 3 p. m., arrive Lake Hotel 5 p. m.

Fifth day.—Leave Lake Hotel 9 a. m., arrive Canyon Hotel 12 noon.

Sixth day.—Leave Canyon Hotel 9.30 a. m., arrive Norris 12 noon; leave Norris 1.30 p. m., arrive Mammoth Springs 4 p. m.; leave Mammoth Springs 6.30 p. m., arrive Cinnabar 8 p. m.

Direct connections made at Cinnabar with Northern Pacific Railroad for St. Paul.

METEOROLOGICAL REGISTER, FORT YELLOWSTONE, WYO.

SEPTEMBER, 1897.							OCTOBER, 1897.							NOVEMBER, 1897.						
Date.	Maximum.	Minimum.	Range.	Winds.	Precipitation.	Remarks.	Date.	Maximum.	Minimum.	Range.	Winds.	Precipitation.	Remarks.	Date.	Maximum.	Minimum.	Range.	Winds.	Precipitation.	Remarks.
1.....	75	42	33	SW.	.....		1.....	56	40	16	SW.	0.27	Rain and sleet.	1.....	39	29	10	S.	.....
2.....	81	42	39	NW.	.....		2.....	48	37	11	S.	.16	Snow (first storm season).	2.....	59	30	29	S.	.....
3.....	59	52	7	NW.	.....		3.....	56	30	26	SW.	.....		3.....	56	31	25	N.	0.38	Snow.
4.....	64	44	20	SW.	.....		4.....	62	34	28	SW.	.....		4.....	39	37	2	N.	.....	Earthquake at 2.30 a.m.
5.....	77	49	28	S.	Trace		5.....	68	34	34	SW.	.....		5.....	34	14	20	W.	.....
6.....	77	45	32	SW.	.....		6.....	68	34	34	SW.	.....		6.....	32	22	11	S.	.20	Snow.
7.....	79	58	21	S.	.....		7.....	72	35	37	NW.	.09	Rain.	7.....	31	15	16	N.	.10	Snow.
8.....	55	47	8	NW.	.....		8.....	64	49	15	NW.	.....		8.....	25	11	14	N.	.15	Snow.
9.....	58	26	32	NW.	.....		9.....	54	24	30	S.	.....		9.....	27	7	20	W.	.....
10.....	71	33	38	S.	.....		10.....	56	28	28	NW.	.....		10.....	42	18	24	S.	.....
11.....	66	46	20	NW.	Trace		11.....	55	41	14	NW.	.....		11.....	44	30	14	S.	.....
12.....	66	46	20	NW.	Trace		12.....	54	35	19	NW.	.08	Rain.	12.....	47	34	13	S.	.19	Rain.
13.....	75	37	38	S.	Trace		13.....	38	27	11	N.	.87	Snow.	13.....	52	43	9	S.	.11	Rain.
14.....	56	41	15	S.	.....		14.....	32	23	9	N.	.15	Snow.	14.....	48	35	13	W.	.30	Snow.
15.....	51	41	10	S.	.....		15.....	38	19	19	NW.	.....		15.....	28	20	8	N.	.....
16.....	61	28	33	NW.	.....		16.....	38	14	24	W.	.....		16.....	22	9	13	NW.	.....
17.....	74	33	41	S.	.....		17.....	44	20	24	SW.	.....		17.....	34	10	24	SW.	.....
18.....	72	35	37	NW.	.....		18.....	48	27	21	S.	.....		18.....	49	30	19	S.	.....
19.....	75	35	40	S.	.....		19.....	58	26	32	S.	.....		19.....	47	38	9	S.	.55	Snow.
20.....	74	37	37	S.	.....		20.....	54	31	23	S.	.....		20.....	54	40	14	S.	.40	Snow.
21.....	78	37	41	S.	.....		21.....	63	33	30	SW.	.04	Rain.	21.....	40	16	24	NW.	.....
22.....	74	42	32	NW.	.....		22.....	44	40	4	N.	.20	Rain.	22.....	33	6	27	N.	.....
23.....	70	45	25	SW.	.....		23.....	48	36	12	S.	.06	Rain.	23.....	37	21	16	SW.	.....
24.....	73	37	36	SW.	.....		24.....	50	38	12	W.	.....		24.....	45	33	12	N.	.....
25.....	76	37	39	S.	.....		25.....	38	30	8	N.	.....		25.....	38	23	15	NW.	.05	Snow.
26.....	76	41	35	S.	.....		26.....	38	29	9	NW.	.....		26.....	81	13	18	S.	.80	Snow.
27.....	73	46	27	SW.	0.27	Rain.	27.....	41	16	25	W.	.....		27.....	26	21	5	S.	.15	Snow.
28.....	66	43	23	SW.	.....		28.....	55	26	29	S.	.....		28.....	24	6	18	N.	.10	Snow.
29.....	67	38	29	S.	.....		29.....	59	30	29	SW.	.....		29.....	26	1	25	S.	.....
30.....	72	42	30	SW.	.04	Rain.	30.....	52	26	26	SW.	.....		30.....	35	21	14	S.	.....
Total	2,091	1,218	873	.....	.81		Total	55	26	29	SW.	.....		Total	1,145	664	481	.....	2.98	
Mean	69.70	40.60	29.10	S.	.....		Mean	51.16	30.64	20.51	SW.	1.72		Mean	38.16	22.13	16.03	S.	.....

Maximum, 81° on 2d instant; minimum, 29° on 9th instant; mean, 56.15°; total precipitation, 0.31 inch; prevailing winds, south.

Maximum, 79° on 6th instant; minimum, 14° on 16th instant; mean, 40.90°; total precipitation, 1.72 inches; prevailing winds, southwest.

Maximum, 69° on 2d instant; minimum, 1° on 29th instant; mean, 30.19°; total precipitation, 2.98 inches; prevailing winds, south.

Maximum, 81° on 2d instant; minimum, 26° on 9th instant; mean, 55.15°; total precipitation, 0.31 inch; prevailing winds, south.

Maximum, 72° on 6th instant; minimum, 14° on 16th instant; mean, 40.90°; total precipitation, 1.72 inches; prevailing winds, southwest.

Maximum, 59° on 2d instant; minimum, 10° on 29th instant; mean, 30.15°; total precipitation, 2.98 inches; prevailing winds, south.

METEOROLOGICAL REGISTER, FORT YELLOWSTONE, WYO.—Continued.

DECEMBER, 1897.							JANUARY, 1898.							FEBRUARY, 1898.						
Date.	Maximum.	Minimum.	Range.	Winds.	Precipitation.	Remarks.	Date.	Maximum.	Minimum.	Range.	Winds.	Precipitation.	Remarks.	Date.	Maximum.	Minimum.	Range.	Winds.	Precipitation.	Remarks.
1.....	30	15	15	S.	.....		1.....	25	3	22	S.	.....		1.....	32	10	22	S.	.....
2.....	28	7	21	S.	.....		2.....	39	9	30	NW.	.....		2.....	31	5	26	S.	0.01	Snow.
3.....	29	5	24	N.	.....		3.....	36	25	11	NW.	Trace		3.....	31	18	13	NW.	.....
4.....	23	11	12	N.	0.05	Snow.	4.....	37	15	22	NW.	.....		4.....	30	19	11	S.	Trace	
5.....	30	19	11	SW.	.....		5.....	32	25	7	SW.	.....		5.....	39	19	20	S.	.....
6.....	37	23	14	W.	.....		6.....	34	25	9	S.	.....		6.....	37	32	5	S.	.....
7.....	35	29	6	SW.	.....		7.....	32	20	12	SW.	0.01	Snow.	7.....	40	31	9	SW.	.....
8.....	36	25	11	S.	.45	Snow.	8.....	33	15	18	S.	.10	Snow.	8.....	39	22	17	SW.	.....
9.....	27	19	8	S.	.....		9.....	23	13	10	S.	.20	Snow.	9.....	26	7	19	S.	.....
10.....	31	18	13	SW.	.....		10.....	17	1	16	NW.	.....		10.....	34	12	22	N.	.....
11.....	31	18	13	SW.	.....		11.....	15	3	12	SW.	.....		11.....	34	13	21	S.	.....
12.....	32	23	9	S.	.....		12.....	16	6	10	S.	.....		12.....	36	23	13	S.	.....
13.....	33	14	19	S.	.....		13.....	18	4	14	S.	Trace		13.....	33	21	12	SW.	.....
14.....	30	16	14	S.	.....	Snow.	14.....	15	6	9	NW.	.....		14.....	41	29	12	S.	.10	Snow.
15.....	0	5	5	N.	.....		15.....	25	10	15	N.	.....		15.....	38	33	5	S.	.....
16.....	6	19	13	SW.	.....		16.....	22	12	10	S.	.....		16.....	37	16	21	SW.	.80	Snow.
17.....	16	4	12	SW.	.....		17.....	21	4	17	SE.	.....		17.....	13	1	12	NW.	.10	Snow.
18.....	17	3	14	S.	.....		18.....	24	5	19	SW.	.....		18.....	20	3	17	N.	.....
19.....	18	4	14	S.	.....		19.....	27	15	12	S.	.....		19.....	29	8	21	N.	.....
20.....	13	1	12	NE.	.....		20.....	23	5	18	SW.	.....		20.....	38	19	19	S.	.....
21.....	18	3	15	S.	.....		21.....	20	3	17	S.	.....		21.....	39	20	19	S.	.....
22.....	25	7	18	S.	.....		22.....	17	8	9	N.	.....		22.....	32	5	27	SW.	.....
23.....	29	5	24	S.	.....		23.....	18	1	17	SW.	.....		23.....	32	2	30	NW.	.....
24.....	27	19	8	S.	.....		24.....	10	20	30	N.	.....		24.....	45	9	36	NW.	.....
25.....	29	17	12	S.	.....		25.....	8	15	23	N.	.....		25.....	35	21	14	S.	.....
26.....	31	15	16	S.	.....		26.....	9	6	13	NW.	.....		26.....	39	13	26	SW.	.....
27.....	34	25	9	S.	.....		27.....	19	3	16	NW.	.....		27.....	45	12	33	SW.	.....
28.....	37	30	7	N.	.10	Snow.	28.....	23	6	17	N.	.....		28.....	42	23	19	S.	.....
29.....	37	31	6	SW.	.....		29.....	26	5	21	N.	.....		29.....	45	12	33	SW.	.....
30.....	37	15	22	NW.	.....		30.....	30	13	17	N.	.....		30.....	45	12	33	SW.	.....
31.....	15	6	9	NW.	.....		31.....	33	9	24	SW.	.....		31.....	42	23	19	S.	.....
Total.	307	874	433	.....	.80		Total.	717	310	401	SW.	.....		Total.	963	446	517	.....	1.21	
Mean.	28.03	12.06	13.98	S.	.....		Mean.	22.12	10.00	16.43	SW.	.31		Mean.	34.39	15.92	18.46	S.	.....

Maximum, 37° on 28th and 30th instant; minimum, -10° on 15th instant; mean, 19.04°; total precipitation, 0.80 inch; prevailing winds, south.

Maximum, 39° on 24 instant; minimum, -20° on 24th instant; mean, 14.72°; total precipitation, 0.31 inch; prevailing winds, south-west.

Maximum, 46° on 24th and 27th instant; minimum, 10° on 17th instant; mean, 23.15°; total precipitation, 1.31 inches; prevailing winds, south.

METEOROLOGICAL REGISTER, FORT YELLOWSTONE, WYO.—Continued.

MARCH, 1898.							APRIL, 1898.							MAY, 1898.						
Date.	Maximum.	Minimum.	Range.	Winds.	Precipitation.	Remarks.	Date.	Maximum.	Minimum.	Range.	Winds.	Precipitation.	Remarks.	Date.	Maximum.	Minimum.	Range.	Winds.	Precipitation.	Remarks.
1.....	44	26	14	N.	.....		1.....	44	6	38	SW.	.....		1.....	38	26	12	NW.	Trace	
2.....	40	24	16	S.	.....		2.....	51	27	24	SW.	.....		2.....	35	24	11	N.	Trace	
3.....	39	27	12	NW.	.....		3.....	31	24	7	NW.	0.10	Snow.	3.....	40	25	15	N.	.....
4.....	37	25	12	SW.	.....		4.....	38	18	20	SW.	.....		4.....	44	25	19	NW.	Trace	
5.....	41	17	24	S.	.....		5.....	46	12	34	S.	.....		5.....	40	23	17	NW.	Trace	
6.....	43	20	23	SW.	.....		6.....	50	22	28	SW.	.....		6.....	54	30	24	SW.	Trace	
7.....	45	20	25	SE.	0.20	Snow.	7.....	38	25	13	SW.	0.05		7.....	59	30	29	SW.	.....
8.....	40	18	22	NW.	.....		8.....	42	25	17	S.	.....		8.....	54	39	15	W.	.....
9.....	23	17	6	N.	.....		9.....	54	31	23	SW.	.....		9.....	65	30	35	W.	.....
10.....	25	2	23	N.	.....		10.....	59	32	27	SW.	.....		10.....	70	35	35	W.	.....
11.....	26	1	25	NW.	.....		11.....	51	31	20	SW.	.....		11.....	63	43	19	SW.	.....
12.....	32	2	30	SW.	Trace	Snow.	12.....	54	25	29	SW.	30		12.....	58	37	21	N.	.....
13.....	33	19	14	NW.	.....		13.....	59	34	25	SW.	.....		13.....	65	35	30	SW.	.....
14.....	33	13	20	N.	.....		14.....	65	35	30	SW.	.....		14.....	61	34	27	NW.	.....
15.....	29	7	22	N.	.....		15.....	68	34	34	SW.	.....		15.....	66	34	32	N.	0.15	Rain.
16.....	24	0	24	N.	.....		16.....	68	36	32	N.E.	Trace		16.....	51	40	11	N.	.....
17.....	32	7	25	N.	Trace		17.....	47	35	12	N.E.	Trace		17.....	51	40	11	N.	.....
18.....	26	7	19	NW.	Trace		18.....	48	28	20	N.E.	.....		18.....	54	37	17	SE.	.....
19.....	25	6	19	N.	.....		19.....	52	24	28	N.E.	.....		19.....	53	37	16	SW.	.....
20.....	30	19	11	S.	.....	Snow.	20.....	53	31	22	N.	.....		20.....	58	32	26	SW.	.....
21.....	26	4	22	N.	.....	Snow.	21.....	54	37	17	NW.	.....		21.....	58	40	18	NW.	.....
22.....	26	4	22	N.	.....	Snow.	22.....	52	35	17	NW.	.....		22.....	63	40	23	NW.	.....
23.....	25	6	19	NW.	.....		23.....	54	32	22	SE.	.....		23.....	58	40	18	NW.	0.45	Rain.
24.....	35	18	17	S.	.....		24.....	62	28	34	SE.	.....		24.....	48	37	11	N.	.....
25.....	32	16	16	NW.	.....		25.....	67	34	33	NW.	.....		25.....	55	40	15	N.E.	.....
26.....	21	5	16	NW.	.....		26.....	68	43	25	NW.	.....		26.....	59	42	17	N.E.	.....
27.....	25	7	18	NW.	.....		27.....	52	30	22	W.	.....		27.....	73	39	34	NW.	.....
28.....	29	6	23	NW.	.....		28.....	59	27	32	SW.	.....		28.....	58	41	17	SW.	.....
29.....	29	1	28	SW.	.....		29.....	55	30	25	NW.	.....		29.....	58	36	22	NW.	.....
30.....	32	13	19	SW.	.....		30.....	55	30	25	NW.	.....		30.....	58	38	20	SW.	.....
31.....	34	13	21	SW.	.....		31.....	42	28	14	NW.	20	Snow.	31.....	52	29	23	SW.	.....
Total.	964	826	638	.....	1.40		Total.	1,573	859	714	.....	95		Total.	1,728	1,065	663	.....	1.95	
Mean.	31.09	10.51	20.58	NW.	.....		Mean.	52.43	28.63	23.80	SW.	.....		Mean.	55.67	34.35	21.32	SW.	.....

Maximum, 45° on 7th instant; minimum, -22° on 22d instant; mean, 30.80°; total precipitation, 1.40 inches; prevailing winds, northwest.

Maximum, 68° on 15th and 26th instant; minimum, 4° on 1st instant; mean, 41.03°; total precipitation, 0.95 inch; prevailing winds, southwest.

Maximum, 73° on 27th instant; minimum, 23° on 5th instant; mean, 47.51°; total precipitation, 1.95 inches; prevailing winds, southwest.

METEOROLOGICAL REGISTER, FORT YELLOWSTONE, WYO.—Continued.

JUNE, 1898.							JULY, 1898.							AUGUST, 1898.						
Date.	Maximum.	Minimum.	Range.	Winds.	Precipitation.	Remarks.	Date.	Maximum.	Minimum.	Range.	Winds.	Precipitation.	Remarks.	Date.	Maximum.	Minimum.	Range.	Winds.	Precipitation.	Remarks.
1.....	61	39	22	SW.	0.32	Rain.	1.....	50	39	11	N.	.....	.....	1.....	73	48	25	N.	.....	.....
2.....	53	35	18	NW.	.....	.....	2.....	67	33	36	W.	.....	.....	2.....	78	40	38	N.	.....	.....
3.....	46	31	15	NW.	.15	.....	3.....	76	40	36	SW.	.....	.....	3.....	84	47	37	N.	.....	.....
4.....	48	36	12	NW.	.....	Rain.	4.....	80	47	33	SW.	.....	.....	4.....	81	47	34	N.	.....	.....
5.....	53	34	19	NW.	.03	.....	5.....	81	53	28	SW.	.....	.....	5.....	67	49	18	N.	0.10	Rain.
6.....	56	34	22	NW.	.....	Rain.	6.....	78	44	34	SW.	.....	.....	6.....	74	37	37	NW.	.....	.....
7.....	64	32	32	NW.	.....	.....	7.....	81	49	32	SW.	0.15	Rain.	7.....	79	43	37	N.	.....	.....
8.....	69	35	34	NW.	.....	.....	8.....	80	47	33	SW.	.30	Rain.	8.....	84	46	38	N.	.....	.....
9.....	(a)	38	.....	NW.	.....	.....	9.....	79	45	34	W.	.....	.....	9.....	85	49	36	N.	.....	.....
10.....	(a)	39	.....	NW.	.....	Rain.	10.....	86	51	35	SW.	.....	.....	10.....	84	54	30	E.	.....	.....
11.....	(a)	40	.....	NW.	.50	.....	11.....	87	49	38	SW.	.60	Rain.	11.....	84	50	34	SW.	.....	.....
12.....	(a)	40	.....	NW.	.....	Rain.	12.....	77	57	20	S.	.....	.....	12.....	89	54	35	SW.	.....	.....
13.....	(a)	43	.....	NW.	.20	.....	13.....	79	49	30	SW.	.....	.....	13.....	74	50	24	SW.	.....	.....
14.....	(a)	45	.....	NW.	.15	Rain.	14.....	86	52	34	SW.	.....	.....	14.....	70	50	20	SW.	.....	.....
15.....	(a)	39	.....	SW.	.....	.....	15.....	86	52	34	SW.	.....	.....	15.....	76	53	23	SW.	.....	.....
16.....	(a)	53	.....	SW.	.....	.....	16.....	86	51	35	SW.	.....	.....	16.....	72	49	23	SW.	.....	.....
17.....	80	49	31	S.S.	.....	.....	17.....	77	48	29	SW.	.....	.....	17.....	78	44	34	SW.	.....	.....
18.....	87	49	38	S.S.	.....	.....	18.....	66	39	27	W.	.....	.....	18.....	84	42	42	SW.	.....	.....
19.....	87	55	32	S.	.....	.....	19.....	70	43	27	W.	.....	.....	19.....	86	43	43	SW.	.....	.....
20.....	76	49	27	S.	.....	.....	20.....	80	39	41	SW.	.....	.....	20.....	87	49	38	SW.	.....	.....
21.....	74	39	35	S.	.....	.....	21.....	77	53	25	SW.	.10	Rain.	21.....	83	55	28	SW.	.....	.....
22.....	68	47	21	S.	.35	Rain.	22.....	81	45	36	SW.	.....	.....	22.....	74	44	30	NW.	.....	.....
23.....	71	53	18	S.	.45	Rain.	23.....	82	47	35	SW.	.....	.....	23.....	74	40	34	NW.	.....	.....
24.....	66	46	20	SW.	.....	.....	24.....	81	46	35	SW.	.....	.....	24.....	84	41	43	SW.	.....	.....
25.....	71	53	18	SW.	.....	.....	25.....	82	49	33	S.	.....	.....	25.....	88	45	43	NW.	.....	.....
26.....	80	46	34	SW.	.....	.....	26.....	81	45	36	SW.	.....	.....	26.....	85	58	27	NW.	.50	Rain.
27.....	70	46	24	NW.	.....	.....	27.....	83	47	36	W.	.....	.....	27.....	80	48	32	NW.	.15	Rain.
28.....	73	34	39	NW.	.35	Rain.	28.....	81	46	35	W.	.....	.....	28.....	76	45	31	SW.	.45	Rain.
29.....	70	43	27	N.	.15	S.	29.....	72	45	27	NW.	.....	.....	29.....	68	50	18	SW.	.15	Rain.
30.....	73	43	30	N.	.....	.....	30.....	76	39	37	N.	.....	.....	30.....	68	50	18	SW.	.....	.....
Total	1,293	.....	.....	.....	2.97	.....	Total	2,425	1,427	998	.....	1.15	.....	Total	2,465	1,451	1,004	.....	2.06	.....
Mean	41.70	.....	.....	NW.	.....	.....	Mean	78.23	46.08	32.30	SW.	.....	.....	Mean	79.19	46.51	32.68	SW.	.....	.....

Maximum, not known; minimum, 31° on 2d instant; mean, not known; total precipitation, 2.67 inches; prevailing winds, northwest.

Maximum, 89° on 11th and 26th instant; minimum, 39° on 2d instant; mean, 69.19°; total precipitation, 1.15 inches; prevailing winds, southwest.

Maximum, 89° on 12th instant; minimum, 57° on 6th instant; mean, 69°; total precipitation, 2.06 inches; prevailing winds, southwest.

* Thermometer broken.

Diary of Yellowstone Park scouts, winter season of 1897-98.

[George Whittaker, 1897.]

November 6.—Left Mammoth Hot Springs for Norris; arrived at Norris 7.30 p. m. Saw 5 elk on Swan Lake Meadow, 2 coyotes at Willow Park. Weather cloudy and cold.

November 7.—Left Norris station at 9.30 a. m., and proceeded to Mud Geyser; arrived Mud Geyser 6 p. m. Saw 25 elk 1 mile west of Canyon Junction, large band near Sulphur Mountain, 172 on east side of Yellowstone River, opposite mouth of Alum Creek; 1 red fox and 3 coyotes at Trout Creek bridge. Weather very cold and snowing heavy.

November 8.—Left Mud Geyser station and crossed Yellowstone River in a boat. Went on foot for about 4 miles east, making about 8 miles in all. Saw 1 deer track, 2 red foxes. Weather storming and cold.

November 9.—Left Mud Geyser station with Sergeant Simons and Private Akers and proceeded to Pelican Creek cabin. Saw 1 elk. Weather, blinding snowstorm all day.

November 10.—Left cabin with Sergeant Simons, dismounted, for Pelican Cone and Mnah Kettles on Pelican Creek; made a circuit of about 10 miles; almost impossible to travel with horses. Weather stormy. Saw 1 elk.

November 11.—Left cabin with Sergeant Simons, mounted, for head of Astringent Creek and White Lake. Left Private Akers at cabin until we returned. Proceeded about 4 miles on horses, then proceeded on foot to south end of White Lake; could not get there with horses on account of deep snow. Saw no sign of any kind all day. Snow between 2 and 3 feet deep on the head of Astringent Creek. Weather stormy.

November 12.—Left cabin for head of Raven Creek, mounted; proceeded as far as beaver dams, where snow was too deep to travel with horses. Saw some fresh beaver sign. Decided to go back to Mud Geyser station for grain and rations and return in three or four days. No sign of any other game. Weather, snowing and raining; snow going very fast.

November 13.—Left Mud Geyser station for Trout Creek cabin, with snowshoe rations for cabin; took Sergeant Simons and Private Akers to assist me in putting wood in cabin, and show them route to Thumb in winter time. Saw no sign of game in Hayden Valley, something very unusual at this time of the year. Weather cold and stormy.

November 14.—Left Trout Creek cabin for Fountain station; decided to take Sergeant Simons and Private Akers with me and return to Mud Geyser from Fountain and go back to Pelican as soon as I get through at this place. Had intended to go up to Bear Parks and Shoshone Geyser Basin and take Corporal Holman and one private with me, but corporal informed me that he had just returned from Bear Parks five days ago and saw no sign of any game in there, and had also tried to get to Shoshone Geyser Basin with horses, and the deep snow drove him back. There being nothing further to detain me here, I decided to return to Mud Geyser to-morrow and try the Pelican Creek again. Left Trout Creek cabin at 11.45 a. m. and got to foot of Mary's Mountain about 1 p. m. After we got to Snow cabin at foot of mountain I saw two very fresh tracks, should say half hour old; examined them closely and saw they were buffalo; about half mile farther came out two more tracks, which proved to be buffalo also, but not so large as first two, and one more half mile east of Magpie Creek; thought best not to pursue them; presume they were somewhere back of Fountain Hotel all summer and are just moving into Hayden Valley. Some beaver sign in Nez Perce Creek. Weather very cold and stormy.

November 15.—The stock being very tired, and it being very cold and stormy, I decided to lay over to-day and return to Mud Geyser to-morrow; and by the time I got a telephone message in to post about buffalo it was 11 a. m. before I got back to station, almost too late to start for Mud Geyser. Requested Corporal Holman to ride up to Twin Buttes and see if there were any buffalo sign there. He returned and reported nothing but elk sign and some beaver sign in Sentinel Creek. Weather cold and stormy.

November 16.—Left station for Mud Geyser station with Sergeant Simons and Private Akers via Mary's Mountain. Arrived at station 4.30 p. m. Saw 15 elk on Nez Perce Creek at foot of Mary's Mountain. Observed that Corporal Holman is very attentive to the duty assigned him to prevent poaching in the park. Weather cloudy and cold.

November 17.—Stayed at Mud Geyser station to start for Pelican Creek to-morrow; there being some work to do pertaining to my stock and saddles, was too late to make a start to-day. Weather clear and cold.

November 18.—Left Mud Geyser station with Sergeant Simons and Private Murphy for Pelican Creek cabin, intending to go up to Mirror Plateau and head of Flint Creek. Arrived at cabin at 4 p. m. Saw 14 swan on Yellowstone River above ford. Weather cloudy.

November 19.—Left cabin for Mirror Plateau, but found, after proceeding about 5 miles, the snow so deep and hard that could not go there, so tried to go up to summit of the mountain and go down Willow Creek, but could not get there, so had to turn back. Could do nothing with horses on account of snow. Saw two buffalo tracks on Astringent Creek; quite a number of elk sign on Pelican Creek. Weather cold and stormy.

November 20.—Left cabin for Mud Geyser station with intention of returning to post, it being useless to try to do anything with horses. Saw 27 swan on river above ford. Weather stormy and cold.

November 21.—Left Mud Geyser for Norris; arrived at Norris at 5.30 p. m. In my experience with the detachment at Mud Geyser I found that they were preventing any poaching being done in their district. A band of about 200 elk crossed the river above Alum Creek, just as I came by. Weather cloudy and cold.

November 22.—Left Norris station for Fort Yellowstone; stayed back with teamster to remove large rock out of road, but could not remove it; tried to pull it out, but could not. Fixed telephone wire at Crystal Spring. Saw a band of about 200 elk at Swan Lake; about 75 elk in the timber about 1 mile post from post; 15 deer at Golden Gate. Weather cloudy.

[James G. Morrison, 1897.]

November 24.—Left the post with Privates McReynolds and Miller to go over on the Gallatin. On account of the deep snow we got no farther than the pocket on Fawn Creek, where we camped. Saw about 750 elk; also numerous signs of beaver on the Gardiner River and Fawn Creek. Distance traveled, about 12 miles.

November 25.—Took back trail down Fawn Creek about 4 miles, thence south along Quadrant Mountain to Indian Creek and up it about 4 miles to snowshoe shack, where we camped. Saw about 150 elk; many signs of beaver on this creek. Distance traveled, about 15 miles.

November 26.—Remained in camp, scouting up Indian Creek. No signs of game. Distance traveled, about 10 miles.

November 27.—Proceeded to the post. Distance, 12 miles.

[George Whittaker, 1897.]

November 23 to 25.—Doing duty at Fort Yellowstone.

November 26.—Received order to go to Mud Geyser with pack mule and four pairs snowshoes.

November 27.—Left Fort Yellowstone for Norris; left post at 3 p. m., arrived Norris 7.30 p. m. Weather cold and storming. Saw 19 elk 6 miles south of post; also 2 deer and 3 coyotes $6\frac{1}{2}$ miles south of post.

November 28.—Left Norris 10.30 a. m. for Mud Geyser; arrived Mud Geyser 4.30 p. m. Took Sergeant Welsh and Private Helm to assist me to Canyon Junction, but finding my horse and mule and Sergeant Simons's horse very tired, decided to have them go to Mud Geyser with me and return the following day via Canyon Hotel to see if it was possible to make a trip due north to Fort Yellowstone from Grebe Lake. Saw a band of elk on east side of Yellowstone River between Trout Creek and Mud Geyser; presume there were about 70 of them. Weather clear, until evening it began to snow.

November 29.—Left Mud Geyser on return trip to Norris with Sergeant Welsh and Private Helm. Went to Canyon Hotel to see how deep snow was, but found it too deep to go to Grebe Lake with horses. Went to hotel and sent Captain Erwin, the assistant superintendent of the park, the following message over telephone:

"Trip must be made on snowshoes. Leave Canyon; will be at Norris about 4 p. m. If any other orders call Norris.

"WHITTAKER, Scout."

Did not arrive at Norris until 5 p. m. Weather forenoon cloudy, afternoon snowing very hard. Hard for stock to travel and make time.

November 30.—Stayed at Norris to wait for wagon to come with snowshoes. During the day I took Sergeant Welsh and Private Hemstead with their skis and broke the trail as far as Virginia Meadows; made a circuit of about 7 miles; found it very hard snowshoeing; the snow was very soft and our skis would sink about 6 to 8 inches. Wagon arrived at 5 p. m. with skis for Norris station and myself and Scout Malin. Weather very stormy.

December 1.—Sergeant Welsh, Scout Malin, and myself left Norris on snowshoes for Canyon Hotel at 9.45 a. m., arrived at Canyon at 3.30 p. m.; found snowshoeing fairly good for time of year. Depth of snow from 18 to 30 inches between Norris and Canyon Hotel. One mountain lion track on Canyon road 1 mile east of Norris; one on sulphur beds 3 miles west of Canyon. Met lineman and Privates Murphy and Davis on their way to Norris to get some mail which was brought out on the

wagon yesterday; they return to Mud Geyser to-morrow. I sent my horses in from Norris by Private Hemstead. No game seen. Weather clear.

December 2.—Left Canyon Hotel with Sergeant Welsh and Scout Malin to make a trip to Grebe Lake, thence north to Fort Yellowstone, on snowshoes. Left Canyon Hotel at 8.35 a. m.; went up Cascade Creek to lake, thence to Grebe Lake; found all beaver had not been molested. Cut north from Grebe Lake and went to poachers' old cabin on the head waters of a tributary of Lava Creek. Saw no game. Snowshoeing was very easy to-day. Made about 10 miles from Canyon Hotel. Depth of snow, from 12 to 24 inches up to Grebe Lake; from there the snow was from 3 to 4 feet. Weather clear; 10 degrees below zero this morning at 6.30 o'clock.

December 3.—Left cabin with Sergeant Welsh and Malin at 7.30 a. m.; began to climb the divide and kept working along the top until we came to Storm Peak, then began to descend to Lupine Creek; when we reached the creek bed, we found it very hard shoeing on account of lack of snow. On the divide from the cabin all the way to Lupine Creek the snow was about 4 to 5 feet deep. No sign of anybody in that district. There seems to be a great many pine marten around Storm Peak and on the head waters of Lupine Creek; great many elk sign near Wraith Falls. I think we made about 25 miles on our trip for to-day. Weather clear and cold. Came in on foot from top of East Gardiner grade; arrived at post about 7.30 p. m. Saw 3 deer and 1 elk near Blacktail Creek; saw tepee near Storm Peak, but nothing in it. From the divide above cabin could see the Tower Creek country, but saw no sign of anything there.

[N. J. Malin, 1897.]

October 8.—Left Fort Yellowstone with Corporal Ornis and Private Canovan at 2.30 p. m.; arrived at Blacktail Creek at 5 p. m., about 8 miles east from fort. Saw 1 blacktail buck and 2 coyotes on the road.

October 9.—Went on; followed down Blacktail Creek near the mouth; beaver houses and dams had not been disturbed on the creek. I showed Ornis and Canovan the trail to cross the river at mouth of Blacktail; also lower and middle trail going to Cooke City. Camped at Yancey's about 5 p. m. No game seen. Weather very stormy; snow and wind.

October 10.—Left camp at Yancey's at 7.30. Crossed main Yellowstone on Barnett's bridge; then went up Lamar River about 1 mile and forded; then cut across divide to trail on north side of the river, leading to Cooke City, about 2½ miles from Slough Creek; then turned northwest to Buffalo Plateau and made camp near Montana-Wyoming line on a branch of Hell Roaring Creek, 4 p. m. Corporal Herb and Private Hardin came to our camp near 5 p. m.—trailed us from where we hit the trail, on north side of Yellowstone, which leads to Soda Butte and Cooke City.

October 11.—Left camp with Ornis, Herb, and Canovan at 8.30 and traveled east to the pass between Hell Roaring and Buffalo Fork of Slough Creek. Found snow about 18 inches deep and crusted hard, so it was hard for horses to travel; then traveled north to what is considered near the north line of the park. Saw 1 blacktail buck and 4 bull elk; also beaver dam and house and fresh work of the beaver in the creek, which was a small branch of Hell Roaring. Herb sent Harding back to station. Snowing and cold; windy.

October 12.—Traveled north with Ornis, Herb, and Canovan, to north line near Hell Roaring Creek. Saw 5 bull elk on trip. Got back to camp at 5 p. m. Found Harding in camp.

October 13.—Ornis, Herb, and Harding scouted up the main Hell Roaring Creek; reported when returning no sign of game or poachers. I went west on Buffalo Plateau; no sign of game or poachers. Snowing and rain.

October 14.—All left camp at 10.30 a. m. and traveled main trail to Soda Butte. Got to station at 5 p. m.

October 15.—Left station at 10 a. m. with Ornis, Herb, and Bremer. Arrived at upper end of Alastin meadows at 5.30 p. m., about 2 miles south of the line of the park. Richard Randall and Roseborough in the party; they had written permit to carry their guns and to pack meat through the park to Soda Butte, thence along the road to Gardiner. Saw near 1,000 elk on Warm Spring Creek; also a very large band on Specimen Mountain.

October 16.—I took Herb, Bremer, Ornis, and Canovan as near north boundary line as I could judge from the line of Montana and Wyoming. Randall and Roseborough went across the line hunting. Clear and fine.

October 17.—All scouted up Slough Creek to where the line crosses the mountains. Clear and fine.

October 18.—Canovan and myself went across the point of the mountain to Buffalo Fork of Slough Creek to near line of park. The other men went up Slough Creek outside the park, hunting. Ornis killed a blacktail deer. Clear and fine.

October 19.—Started back to Soda Butte Station and arrived at 3.30 p. m. Roseborough and Randall also went to the Butte. Warm; thawing, so the travel was muddy.

October 20.—All remained at the station. Raining all day. Blane and Hoppe captured negro supposed to be the negro who broke jail in Deadwood, Dak.

October 21.—All left station for Cache Creek; followed up the main creek to right-hand fork, thence up the right-hand fork to the canyon, then up the divide to near the line of the park. Camped at 5 p. m. Herb, Ornis, Canovan, and Edwards, Randall, and Roseborough started east, hunting. I went on top of the mountain, so I could see Saddle Mountain and Baronet Peak, to determine, as near as possible, where the line would cut the mountain and creek, and found that we were camped in the park about three-quarters of a mile, as near as I could tell. Herb and Edwards, while hunting, came across the corner of the timber reserve, and found the line of the park; also trees and monuments showing the line. The line is also blazed as far as followed north and south. No sign of game in the country.

October 22.—Started back to station; arrived at 3 p. m. Lots of elk on bottom between Lamar River and Soda Butte Creek. I saw several coyotes and some mountain-lion tracks. Warm and pleasant.

October 23.—Randall, Ornis, Canovan, and I left station at 10 a. m. and arrived at camp on Slough Creek at 4.50 p. m. Saw several thousand elk between Soda Butte and Slough Creek. Both sides of Lamar River alive with elk; as near as I could judge, must have been 7,000.

October 24.—All hunted north of line for camp meat, but nothing outside of the park lines but bulls. Found on my way to camp an old camp where poachers had been camped. Near the line they had left their camp outfit, cooking utensils, also three quarters of elk, hung up in the trees, about 500 yards from their camp.

October 25.—All scouted the country between the north line and Slough Creek to see if we could find any more signs of poachers, but found no camps made lately. The beaver in Slough Creek have not been disturbed.

October 26.—Left camp on Slough Creek and followed it down through the canyon to or near the mouth. Crossed the Lamar River and went to Yancey's place and camped for the night. Several hundred elk at mouth of Slough Creek; also, several hundred on Specimen Mountain and Little Specimen Creek. Ornis killed 1 coyote, and we saw lots of signs and several coyotes.

October 27.—Left camp at 8.30 and arrived at Fort Yellowstone at 2.30. Saw no game, but a large herd had come off of Mount Washburn and crossed the road, going towards the Yellowstone River, near Devils Gut.

November 30.—Left post for Norris Station at 11 a. m. with Sergeant Bernstein, mounted, and Donehue as teamster. Saw a band of near 200 elk on Swan Lake Flat; 2 coyotes on road near Crystal Springs; 24 geese on lake at 3-mile post from Norris. Met syndicate team, with driver and Andy Wold, on road to Springs. Arrived at Norris Station at 4.30 p. m. Ten to 12 inches of snow beyond Crystal Springs to Norris.

December 1.—Left Norris, with Whittaker and Sergeant Welsh, for Canyon on snowshoes at 9.45; arrived at the Canyon Hotel at 3.30. Snow would average about 20 inches deep.

December 2.—Left Canyon Hotel with Whittaker and Sergeant Welsh. Traveled up Cascade Creek to the lake, thence across to Grebe Lake; then took up the trail that Reeb and Smitzer took after the robbery, to the cabin built by poachers. Cascade Creek and Lake frozen and covered with snow, so could tell nothing regarding the beaver in the creek and lake. No sign of game or poachers; snow average about 3½ feet deep.

December 3.—All left cabin at about 7.30 a. m.; traveled to top of divide looking into Tower Creek, then followed along the head of the divide to the head of Lupine Creek, then down the creek to the open country, then across to the main road leading from Springs to Cooke City; arrived at Fort Yellowstone at 8 p. m.; snow 4 to 5 feet deep in mountains, very little in the open country.

December 5.—Made trip along north line back of Cinnabar, then followed around the foot of mountains to target ground, then down old road to Gardiner. Game seen on trip, about 250 antelope in foothills, 3 blacktail deer near old brickyard, 8 bull elk above target ground, 2 live and 8 dead coyotes.

[George Whittaker, 1897.]

December 4.—Reported to the commanding officer for duty.

December 5 and 6.—Doing post duty.

December 7.—Left Mammoth Hot Springs for Yancey's with saddle horse and 2 pack mules. Saw 2 mountain sheep on east end of Mount Everts; 4 elk on Black-tail, 82 one mile west of Yancey's, and 2 deer same place. Weather stormy.

December 8.—Left Yancey's and proceeded to Soda Butte Station. Saw large herd of elk near hot spring, 2 miles southeast of Yancey's—about 75 in the herd; 3 small herds about 1 mile north of the junction of Yellowstone and Lamar rivers, 27 in one herd, 64 in next one, and I will venture to say there were over 300 in the other herd.

Twelve bull elk near the Junction Butte; 59 on the southeast side of Junction Butte; 33 near Cedar Ford of Lamar River; large herd near the mouth of Slough Creek—can say there were between 200 and 300; large herd on the east side of Slough Creek—between 50 and 75; 4 deer on Little Specimen Creek; 11 elk on Specimen divide; large herd on west side of Druid Peak of about 100; some scattered all the way from Amethyst Creek to Soda Butte. Corporal Herb and 2 privates absent on patrol duty on Slough Creek. Weather stormy. Snowed about 5 inches of snow during the night. Saw 7 coyotes near carcass of dead elk, 1 mile from station.

December 9.—Left station on snowshoes for trip up Opal Creek, then over to head of Flint Creek, but broke one of my snowshoes at foot of Specimen Ridge, so had to return to station. Was too late to make the trip by the time I had secured new shoes, so had to abandon it. Corporal Herb promised to make the trip by next Tuesday. Saw 14 elk opposite station. Weather cloudy.

December 10.—Left Soda Butte with Corporal Herb and Scout Malin for Hellroaring Creek. Saw about 700 elk near Junction Meadow; 200 on Slough Creek; about 1,000 scattered around between the outlet of Lamar River and Hellroaring Creek; also between 400 and 500 on east side of Hellroaring; some on west side also, but could not see them very well; should say there were about 150 of them. Camped on the State line near Hellroaring Creek. Saw 1 dead elk on Slough Creek and 6 coyotes eating on his carcass. The elk had evidently been run down and killed by the 6 coyotes last night. It was a last spring calf and was in good condition. Weather fair. No sign of anyone in the country we came over.

December 11.—Left camp with Corporal Herb and Scout Malin. Game seen to-day was 6 large herds of elk—2 herds on east side of Hellroaring creek, 3 herds on west side, and 1 herd on Blacktail Creek. It would be almost impossible to count them, but I will say there were at least 3,000 between Hellroaring and the mouth of Cottonwood Creek and 300 on Blacktail. Saw 3 white-tail deer near east side of Cottonwood Basin, 12 on Gardiner Grade, 1 mountain sheep near Cottonwood. No sign of anybody in the district.

Corporal Herb and his detachment keep a very close watch of that country. Corporal Herb came as far as Blacktail bridge, then left me and went to Yancey's. Malin left me at ford on Yellowstone River. Weather stormy. There were a great many fresh signs of beaver in Blacktail creek about 1 mile from outlet. Arrived at Fort Yellowstone at 4.45.

December 12.—Doing duty at Fort Yellowstone.

December 13.—Left post, mounted, with Private Dawson, of D Troop, and Private Martin, of H Troop, and 3 pack mules, for Fawn Pass. Proceeded as far as Golden Gate, where we were compelled to return to post on account of deep snowdrift in the gate, which was about 15 feet deep on the upper side and tapered down to 7 feet on lower side. Saw 10 deer at 3-mile post south of post. Weather very stormy.

December 19.—Left Fort Yellowstone with Scout Morrison and 4-mule team and driver at 8.10 a. m. for Norris. Had 4-mule team and 8 men to assist our team through the Snow Pass. After getting on the main road at Swan Lake found it fairly good traveling to Indian Creek; began to get very hard from there on; could not get farther than Crystal Spring on account of mules being tired; had to camp there for the night. Saw small herd of elk near the Snow Pass. Weather clear and cold.

December 20.—Left Crystal Spring cabin for the Canyon Hotel at about 8 a. m.; arrived at Norris for dinner. Left Norris at 2 p. m.; arrived at Canyon Hotel at 7.30 p. m. No game on road. Weather clear and cold.

December 21.—Left Canyon Hotel at 6.45 a. m., intending to go to Mud Geyser Station and secure the body of Private Davis, who was found frozen to death 10 miles from Lake Hotel on road to Thumb, and brought to Mud Geyser Station by Sergeants Simons and Welch and Private Akers. Found that Sergeants Simons and Welch had tied the body up with canvas and had everything ready to start back to the Canyon Hotel after dinner. Left Mud Geyser at 1 p. m. with Scout Morrison, Sergeants Simons and Welch and Private Hemstead to return to Canyon Hotel with body of Private Davis. Arrived at Canyon Hotel at 5 p. m. No game seen on road. Weather stormy in forenoon and clear in afternoon. Fairly good traveling for the team.

December 22.—Left Canyon Hotel at 7.25 a. m. for Crystal Spring; arrived at Norris for noon hour; left Norris 1.45 p. m.; arrived Crystal Spring at 5 p. m. Weather clear and cold.

December 23.—Left Crystal Spring with same party for Mammoth Hot Springs; left cabin at 7.04 a. m.; arrived Mammoth Hot Springs 11.55 a. m. Saw 17 elk near Snow Pass. Weather clear and cold. Depth of snow from Norris to Indian Creek about 2 feet; from Norris to Canyon 3 to 4 feet; from Canyon to Mud Geyser from 12 to 30 inches; all the snow is very soft.

December 24.—Left Fort Yellowstone to make a trip to Gardiner, Horr, and Aldridge; arrived at Gardiner; decided to remain over night. Weather cloudy.

December 25.—Left Gardiner City at 8.45 a. m., and proceeded to Horr. Stopped

two hours in Horr, then proceeded to Aldridge; arrived there 12.30 p. m. Weather cloudy.

December 26.—Left Aldridge and returned to Gardiner. Remained in Gardiner over night. Weather stormy.

December 27.—Left Gardiner; from Gardiner went up on Mount Everts; saw a great many elk and antelope up there; saw 6 mountain sheep also; weather cold and stormy; from Mount Everts returned to Fort Yellowstone; arrived at post at 5.30 p. m. On this entire trip I have gathered some information that sooner or later will lead to the arrest of some poachers.

December 31.—Left Fort Yellowstone, mounted, with privates Disbrow and Root, of H Troop. Proceeded as far as Snow Pass, mounted; then proceeded on skis up Glen Creek; then over the divide to head of Gardiner River, at foot of Electric Peak, and camped for the night. Saw 12 elk near head of Glen Creek. Weather clear and cold.

[Geo. Whitaker, 1898.]

January 1.—Left camp with same party for Mulharen Creek and Fish Lake. Camped on Fish Lake over night. Saw one fresh track of mountain sheep. Weather clear.

January 2.—Left Fish Lake at daybreak. Proceeded down Mulharen Creek one mile; then kept working along the park line, intending to go to head of Reese Creek, but Private Root broke one of his snowshoes when we were just opposite Aldridge, so I had to go to the nearest road, as we could not use our skis any more. Saw one old snow trail, which I presume was one week old or more. Came on to an old cabin, but it was empty and there had been nobody near it this winter. The cabin is in the park, but very near the line. Saw no game. Weather clear. We arrived at Mammoth Hot Springs at 2 a. m. on the morning of the 3d.

January 12.—Sergeant Wall, of H Troop, and Corporal Herb, of Soda Butte Station, and myself left Fort Yellowstone for main camp on Big Blacktail Creek. From post we went to first bridge on Gardiner River, then turned to the right and went up the old road to old coal mine. At the coal mine we saw 22 mountain sheep—7 rams and 15 ewes. I then sent Corporal Herb on top of Mount Everts, while Sergeant Wall and I patrolled along the cliffs at Eagles Nest; then went down as far as the Yellowstone River; then up the old Turkey Pen road to Blacktail. Saw 1 mountain sheep near old slaughterhouse on Turkey Pen road; about 20 antelope on Gardiner flat. Saw about 1,200 elk on Mount Everts; saw 21 deer scattered on Mount Everts. Corporal Ornes and Private Bremier left post with pack train with rations and forage for main camp. Found everything O. K. in camp. Weather clear and very cold. Saw one human foot track on Everts, but it was about four days old and was not very plain.

January 13.—Took Sergeant Wall and Corporal Ornes, mounted, and proceeded up Crevasse Creek to patrol that place and also measure the distance from park line to where Miner killed the elk, and found it was 235 yards due south of the line, as near as we could make it. Brought the head to camp to be sent to post as evidence against Mr. Miner. Saw 88 elk on east side of Crevasse Creek; 24 on head of Dry Gulch creek. Weather cloudy.

January 14.—Left camp with Sergeant Wall and Corporal Herb and 3 pack mules to go over to Buffalo Creek and remain there three days, if necessary. Sent Corporal Ornes into the post with 2 mules and letter to Captain Erwin, and elk meat and elk head of Mr. Miner's. Saw 48 elk on Dry Gulch Creek; 4 white-tail deer same place. Elk sign were very numerous on Crevasse Mountain. Weather clear. Went into camp on Buffalo Creek at 4 p. m. The snow is very deep on Crevasse Mountain.

January 15.—Stayed in camp until about 11 a. m., then took Sergeant Wall and rode out toward the park line. Just before we came to the line we found an elk, dressed and covered with a blanket, and there was a fresh track of a man leading into the park, but before we got there he had come out again and gone down towards Bear Gulch, but later on I saw him coming back. I had already found his camp and a man in it who said his partner was out hunting horses, so I sent Corporal Herb down to watch his partner, when he came in, and see what he had with him. At that time I saw a man moving along the cliffs near the Yellowstone River, so I watched him until I thought he was in the park, then went after him and arrested him for hunting in the park. It turned out to be Scotty Crawford, or "Horse-thiel Scotty." Brought him into the post and Captain Erwin ordered him confined until we could find out for certain whether he was in the park or not. Weather cloudy and cold.

January 16.—Left post with Lieutenant Arnold and proceeded to Buffalo Creek, to determine whether Scotty Crawford was in the park when we arrested him. Found the stakes and monuments and found that he (Scotty) was all of 50 yards out, but found where he had been all of 400 yards inside, but when arrested he was about 100

yards outside the line. Returned to Fort Yellowstone at 7.30 p. m. Weather clear and cold.

January 17.—Stayed at Fort Yellowstone to meet Sheriff Young from Livingston. He arrived on the mail stage and said he would take charge of Scotty in Gardiner, to-morrow. Told him I would meet him at 10 a. m. Weather cloudy, not very cold.

January 18.—By order of Captain Erwin, took prisoner Crawford to Gardiner and turned him over to Sheriff Young, who told me to have all the witnesses to appear in Horr at 2 o'clock p. m. I sent Private Root up to camp and told him to have Sergeant Wall and Corporal Herb come down at once and move the camp down also. They arrived at 2 p. m. in Gardiner; then I took them to Horr. Scotty was tried and found "not guilty." Then his partner had Sergeant Wall arrested for taking his gun away from him, but Sergeant Wall was discharged. Justice Erret said he could not make a case of it. Returned to post at 8.45 p. m. Weather clear and very cold. Saw 8 mountain sheep at Eagles Nest.

January 19.—Stayed at post to wait for Private Carter to come in from camp on Blacktail Creek; he arrived at 8.45 p. m.

January 20.—Left post, mounted, and rode over to Mount Everts. Saw 8 mountain sheep on Mount Everts; about 600 elk there also; 6 deer same place. Saw where somebody had built a small footbridge across the Gardiner River, near the mouth. Returned to post at 5 p. m. Weather clear and cold.

January 21.—Left post with Private Weston, of H Troop, mounted. Proceeded from the bridge 2 miles north of post to the old coal bank on Mount Everts; from there to mouth of Gardiner River, thence along the north line of park as far as the Gassert ranche, thence back to Fort Yellowstone. Saw 11 mountain sheep on Mount Everts; about 200 antelope on Gardiner flat on east side of the Gardiner River; 4 whitetail deer near Government garden; 7 near post ice house; about 75 elk back of the Gassert ranche. Arrived at post about 5.30 p. m. Weather clear and cold.

January 22.—Remained in post until 6 p. m., then packed up 5 mules and left post with Sergeant Wall, Private Weston, and Private Martin to make a night camp on Mount Everts. Made camp on McMahon Creek at 8.10 p. m. Returned to post with Private Martin at 9.20 p. m. Left Sergeant Wall and Private Weston of H Troop in camp for six days, by order of Captain Erwin. Weather stormy and cold.

January 23.—Left post, mounted, with Private Carter and Private Martin, of H Troop, and Private Squires, of D Troop, and 5 pack mules to make a camp just back of Cinnabar. Left post at 10 a. m.; arrived in camp at 1 p. m. Sent Private Martin back to post with 3 mules. Saw about 150 antelope on Gardiner Flat; 6 elk back of Gassert ranche. Weather, clear and cold.

January 24.—Left camp with Private Carter to make a patrol up Reese Creek. Left camp at 8.30 a. m.; returned at 4.30 p. m. After going up Reese Creek to within one-half mile of park line saw some smoke away up in a little draw or ravine and concluded it was a poachers camp. I went about one-fourth mile inside the park; saw lots of game sign. Tried to ride to foot of Electric Creek, but snow was too deep for our horses; so returned to camp to go up and get Sergeant Wall and Private Weston to come down and help me investigate what that camp is doing there. Weather very cold all day, and clear.

January 25.—Left camp with Private Squires and went up to Sergeant Wall's camp to get him to come down and assist me for one day to investigate camp fire seen yesterday on Reese Creek. When I got to Gardiner I was informed that the sergeant had gone over to Buffalo Creek; so decided to send Private Squires back to camp and I would wait in Gardiner for the return of Sergeant Wall. Saw about 50 antelope on Gardiner Flat. Sergeant Wall arrived from Buffalo Creek at 6.30 p. m. Weather clear and very cold; 18 below zero at Gardiner. Remained with Sergeant Wall over night.

January 26.—Left Sergeant Wall's camp with Sergeant Wall and Private Weston. Proceeded to within 1 mile of Cinnabar, then fired two shots as a signal for Private Carter to meet us in Cinnabar. Left Cinnabar at 11 a. m. and went up Reese Creek as far as the park line, thence along said line to the foot of Electric Peak, thence back to where I saw the smoke on the 21st. Found that where we saw the smoke there is an old man, who built a log cabin last fall. He is mining coal. His cabin is about 150 yards from park line. Saw where two elk or deer had been killed and dragged down Reese Creek to Horr, but they were killed outside the park. Also found an old bear trap just outside the park; it has been there for about one year. There seems to be a great many fresh elk sign on Reese Creek and all of them are inside the park. Sergeant Wall and Private Weston returned to their own camp this p. m. Weather cloudy and cold.

January 27.—Sent Private Carter up to help Sergeant Wall take out the footbridge across the Gardiner River. Left camp about 2 p. m. and rode up to foot of Sepulchre Mountain to see if any poaching had been done there, but saw no sign of any having been done there. Saw 32 elk at foot of Sepulchre Mountain. Private Carter returned at 5.30 p. m. from Sergeant Wall's camp. He informed me that the foot-

bridge was taken out by Sergeant Wall and himself. He saw about 100 antelope on Gardiner Flat. Weather cloudy and very windy.

January 28.—Left camp with Private Squires to make a patrol up Reese Creek. As this is the day I am told to go to the post, thought that I had better make this patrol before going. Saw where an elk had been killed yesterday—but outside the Park—and dragged to Horr. Returned to camp about 5.30 p. m. and started to pack up and go to Sergeant Wall's camp and take him in also, but when we got there he had just returned from Buffalo Creek to look after Scotty's camp, and it being late and his stock tired, decided to remain there until morning and pull into the post by daybreak. My idea for doing this at night is to keep the hunting class of people thinking the camps were still out where they were. Weather clear and warm.

January 29.—Left camp on McMahon Creek with Sergeant Wall and Private Carter and Private Weston, of H Troop, and Private Squires, of D Troop, at 6.30 a. m. for Fort Yellowstone. Saw about 100 antelope on west slope of Mount Everts; 2 elk and 11 mountain sheep same place. Arrived at post at 8 a. m. Weather clear and very cold. Reported for duty at 9.30 a. m.

[Sergt. M. J. Wall, Troop H, Fourth Cavalry.]

January 23.—Left camp at 10 a. m. Made a patrol on Mount Everts on the south-east slope, with Sergeant Wall and Private Weston. Game seen during patrol, about 100 head of elk and 6 blacktail deer. On the east of Mount Everts discovered an elk killed by a mountain lion, lying south from my camp. Saw tracks about one day old of man and horses passed by my camp and going towards Gardiner. Distance traveled, about 20 miles. Weather very cold.

January 24.—Left camp at 8.30 a. m. Patrolled Turkey Pen Trail with Private Weston. Game seen, 200 head of antelope on Gardiner Flat and 100 head of elk near my camp on the mountain east of Turkey Pen Trail. Saw 3 mountain sheep, and on south of trail saw 200 head of elk. On my return saw man's tracks leading from Gardiner to the ridge south of Yellowstone River; lost his trail in the rocks, and saw one mountain sheep, a ram, which looked to me as if he was hunted. Waited for signs of something to turn up and could find nothing, so returned to camp. Distance traveled, about 25 miles. Weather cold and clear.

January 25.—Left camp at 8.30 a. m. Made a patrol to Buffalo Creek with Private Weston. Game seen during patrol, 100 head of antelope on Gardiner Flat, east of Gardiner River. Found Crawford's camp on Buffalo Creek; went to his camp; spoke to him about the meat that was lying on trail; he said he knew nothing about it. Left his camp and went to the line. Found fresh tracks leading into the park; tracks that were made by a man's foot. Returned to McMahon Creek. Distance traveled, about 25 miles. Weather very cold.

January 26.—Left camp at 9 a. m. Made a patrol of the northern boundary with Scout Whittaker, Private Weston, and Private Carter. Game seen during patrol, about 150 head of antelope on Gardiner Flat and 15 head of elk outside of the line, northwest of Electric Peak. Found the camp that Scout Whittaker thought to be Bucher's was an old prospector's cabin. Was told by a rancher named McMahon that there was deer taken out on Monday (24th) by coal miners. Returned to McMahon Creek. Weather cloudy and cold. Distance traveled, about 20 miles.

January 28.—Left camp at 10 a. m. A patrol made to Gardiner River. Game on Gardiner Flat, 200 head of antelope. Met Private Carter on the side of river; had him help, myself, and Private Weston to cut the footbridge across the Gardiner River. After the bridge was cut went on Turkey Pen Trail. Saw 200 head of elk on east of trail. Returned to camp. Weather windy and cold. Distance traveled, about 15 miles.

January 28.—Left camp at 9.30 a. m. Patrol east of Mount Everts with Private Weston. Game seen on and around Mount Everts, about 600 head of elk and 6 black-tail deer on McMahon Creek, 1 mountain lion on the east side of Mount Everts hunting elk, but when he saw us coming towards him he made for cover. After making this patrol went to Crawford's camp. Found fresh trails leading to the park; too late to follow them, so returned to camp. Weather clear and cold. Distance traveled, about 28 miles.

January 29.—Left camp at 6.30 a. m. Game seen on return to post, 100 head of antelope and 10 mountain sheep on south of Everts. Built a cabin on McMahon Creek.

[George Whittaker, 1896.]

January 4.—Left the post, mounted, and took in all the country at the foot of Sepulchre Mountain down as far as the corner of Chadbourne's rancho; then came back by way of Gardiner City. Saw 4 elk near the target range, about 110 antelope near Gardiner, 5 white-tail deer in Government garden, 12 near Government ice house. Weather clear and very warm.

January 5.—Left Fort Yellowstone with Corporal Ornes, of D Troop, and Private Carter, of H Troop, mounted; took five pack mules and proceeded to mouth of Blacktail Creek and went into camp there, so I could scout all the Crevasse Mountain country. Saw one man on snowshoes; sent Corporal Ornes after him; found out he was coming from Cooke City on his way to Gardiner. He had a pistol, but was sealed at Soda Butte. Saw a great many elk on Blacktail Deer Creek. The beaver in this creek have done a great deal of work, but are not working now. They have not been molested so far this winter. Weather cloudy and very wintry, but not cold.

January 6.—Left camp with Corporal Ornes and left Private Carter in camp; decided to go down the river to J. S. Knowles's ranch and see what was going on there, then go up on Crevasse Mountain and see if there is any poaching going on there; got to J. S. Knowles's cabin; found there was nobody at home; looked around for any elk meat that might be stored there, but found none. We then proceeded up Crevasse Creek; there we found two human footprints in the snow; followed them around to park line. The country was all pawed up by elk; there must have been hundreds of them in there last week, but they have been shot at and they have all moved back into Cottonwood Basin, except 11 that we saw to-day, and they ran for that place as soon as they saw us coming. After going to park line we began to circle a radius of 500 yards to see what those two men had been doing. I found where a quarter of elk had been cached overnight; I suppose it had been dragged there from the cache to Tom Miner's cabin. I followed the trail where it had been dragged, and it led to Tom Miner's door; am going back on the 8th to see just where it was killed; looked to-day as far as the park line, but could not find the carcass. Tom Miner told me, when I asked him who had dragged the meat, that he had, and that he was going to drag some more just as soon as he could get to kill one. My opinion is that he did not kill the elk, but somebody has killed several elk somewhere on Crevasse Creek and gave him the front quarters, for when I got to his cabin he was out and I looked into his meat house, but saw nothing but fore quarters and one old hind quarter of elk or deer; I did not take time to note which. Saw 3 whitetail deer near J. S. Knowles's cabin. Knowles was at home on my return, and so was Miner. Weather, very stormy.

January 7.—Left camp and rode to south end of Cottonwood Basin to meet Corporal Herb, but he failed to come, so returned to camp. Saw 3 whitetail deer and 97 elk to-day along the Yellowstone River. Weather, clear.

January 8.—Left camp with Corporal Ornes, proceeded to Tom Miner's cabin. Requested Miner to go with us and show us where he had killed his elk. At first he refused to do so, but after talking to him a little while he concluded to go. Found that he had first shot the elk outside the park about 500 yards, but the elk ran into the park about 400 yards before he killed it, so he killed the elk inside the park, but wounded it outside, for which I feel that I am in duty bound to arrest him for the offense. Saw a great many herds of elk on Crevasse Mountain near the park line, but they were all inside the park. Two whitetail deer above Miner's cabin. After we got through at Miner's we proceeded to Buffalo Creek, arrived there at sundown. Weather very cold and cloudy. Sent Private Carter into the post with 3 pack mules and note to Captain Erwin.

January 9.—Left camp on Buffalo Creek on foot; went out about half a mile, but it was snowing so hard that we could see nothing whatever, so decided to return to camp and listen for any shooting that might take place, but did not hear any near the park line, except below Gardiner we could hear six shots fired just at dusk and one in the forenoon. Heard two shots fired on Mount Everts about 5.30 p. m. Have seen no sign of anyone having been in the park poaching, except Tom Miner on Crevasse Creek. Saw no game to-day. Weather, stormy; snowing hard all day.

January 10.—Left camp on Buffalo Creek to return to camp on Big Blacktail Creek. Saw no sign of anyone poaching in the park. Got back to Tom Miner's cabin and found him dressing up to leave. I told I would have to arrest him for killing elk in the park. Took him to our camp on Big Blacktail and kept him overnight. Saw a great many elk on Crevasse Mountain, but outside the park. Weather, clear.

January 11.—Left camp on Blacktail for Fort Yellowstone with Corporals Herb and Ornes and prisoner Miner. (Corporal Herb met me on Crevasse Creek on the 10th instant.) Left Mr. Miner's arms and meat in camp, pending action of the commanding officer at the post. Saw 117 elk near mouth of Blacktail and 40 between Blacktail and top of Gardiner grade; 9 blacktail deer on Gardiner grade, 14 at forks of East and West Gardiner rivers; 9 mountain sheep on Mount Everts, opposite same place; 5 deer east corner of pasture. Arrived at the post with prisoner at 1 p. m. Weather, cloudy and very cold.

January 30.—Left post with Sergeant Wall, Private Weston, Private Martin, and 5 pack mules, to put Sergeant Wall in camp on McMahon Creek, on Mount Everts, by order of Captain Erwin. Returned to post with Private Martin and pack mules. Weather, clear.

January 31.—Received orders from Captain Erwin to take 2 privates and 3 pack mules to make a six days' trip to the Soda Butte district and Crevasse Mountain, then return to the post. Weather, clear.

February 1.—Left post with Private Martin, Private Rompre, of H Troop, Private Slough of D Troop, and 4 pack mules, for Hellroaring Creek. Only got as far as outlet of Big Blacktail Creek, on account of the ice in the Yellowstone River, which was frozen out so far from shore that we had to cut a channel through. Camped in old camp at ford of river. Saw two mountain sheep on east point of Mount Everts; got within 30 feet of large ram near the Cooke City road. Saw about 1,000 elk scattered along the road from top of Gardiner grade to mouth of Blacktail Creek. The beaver in Blacktail have not been working lately, nor have they been molested. Clear.

February 2.—Left camp with Privates Rompre and Slough to go up to Soda Butte Station, via Hellroaring and Slough Creeks. Sent Private Martin back to post with 1 mule. Saw about 3,000 elk between Cottonwood Creek and Soda Butte; 3 whitetail deer, 1 blacktail deer; 1 mountain sheep near Cottonwood Creek. Found 3 men absent on patrol duty when I arrived at station, but they returned at 8.15 p. m. Weather, clear.

February 3.—Left station with same party and returned to camp at Blacktail Ford with rations for the brush cabin on Line Creek. On Hellroaring Creek found everything O. K. at the station. Saw about 1,000 elk on Hellroaring, about 700 of them in one herd. Saw 9 mountain sheep near Cottonwood Creek; 3 whitetail deer near the ford of Yellowstone River. Weather, blinding snowstorms for about four hours and very cloudy all day. Average depth of snow 15 inches from Hellroaring to Soda Butte Station.

February 4.—Stayed in camp at Blacktail Ford of the Yellowstone River to fix up brush cabin and listen for any shooting on Crevasse Mountain. Our stock was very tired from our trip to Soda Butte and back here, which is about 28 miles each way. The ice in the river has about all gone out in the last two days. Weather, cloudy in a. m., clear in p. m.

February 5.—Left camp with same party and proceeded to J. S. Knowles's cabin, thence over Crevasse Mountain to Buffalo Creek, to look after Scotty's camp and see what he is doing there. We arrived on Buffalo Creek Mountain about 1.30 p. m. Went into camp inside the park line. Laid low all the afternoon to listen for any shooting that might take place, but did not hear any. Saw an old web snowshoe trail leading into the park from Scotty's camp, but it was three or four days old. Saw where one elk had been shot inside the park, but could not see where it had been butchered. Saw 3 whitetail deer at Knowles Lake, 4 at Knowles Cabin; 42 elk on Crevasse Mountain about 100 yards outside the park. Weather, cloudy and chinook wind blowing.

February 6.—Left camp with same party; went out on the cliffs and watched for anyone coming out or going into the park. Stayed there until about 1 p. m., then went over to my old camp on Buffalo Creek. Found that Scotty had camped there since his arrest, but he has moved away in the last three or four days. I have since been informed that he has moved down the river about 4 miles below Gardiner. After finding he had moved I came over to Sergeant Wall's camp on McMahon Creek; found Sergeant Wall and Private Weston absent on patrol duty. There has not been much of anything going on since January 15. Weather, cloudy and chinook wind. Saw no game.

February 7.—Left camp with Sergeant Wall and made a patrol down to Reese Creek. There has been some elk killed, but outside the park. Privates Weston and Rompre made a patrol over Mount Everts. Private Slough remained in camp. They saw 8 elk and 30 antelope on Mount Everts. We left camp at 6 p. m. for the post; arrived at post at 7.30 p. m. Weather, cloudy and warm wind.

[Sergeant M. J. Wall, 1898.]

January 30.—Left the post at 6.15 p. m.; made camp on McMahon Creek at 8.20 p. m. Night mild.

January 31.—Left camp at 10.20 a. m. Made a patrol on Gardiner Flat. Found Tom Newcomb on Gardiner Flat and told him the commanding officer wanted to see him. Returned to camp and made a patrol on the east side of Mount Everts. Game seen: 100 antelope on the east side of Mount Everts, 6 mountain sheep, same side, and 20 elk on the west side of McMahon Creek. Weather, warm. Traveled about 10 miles.

February 1.—Left camp at 10 a. m. Made a patrol on Turkey Pen Trail and on the east side of Mount Everts. Game seen, 150 antelope on Gardiner Flat, and 200 head of elk counted on northeast side of McMahon Creek, and 1 mountain sheep (a ram) on the mountain northeast of the Turkey Pen Trail, and about 400 elk on the south slope of Mount Everts. Discovered one blacktail deer, killed by a mountain

lion, on the east side of Mount Everts about 100 yards from where he killed the elk. I saw his tracks in a great many places, and believe he is about as big as an African lioness. I saw 5 bull elk south of McMahon Creek. They were all very large. I saw Tom Newcomb on Gardiner Flat, and he gave me a bottle of strychnine to put on the meat, which I did. No signs of anyone having been on Mount Everts since last patrol. Weather, fine and mild. Traveled about 20 miles.

February 2.—Left camp at 8.30 a. m. Made a patrol on Buffalo Creek and Buffalo Mountain with Private Weston. Found Crawford's camp to be abandoned. Looked all around Buffalo Creek and Buffalo Mountain, but he was not to be found in that location; he must have left camp on the 31st of January, in the night. I saw his camp on that day from Mount Everts. There was a man walking on Buffalo Mountain. Saw fresh man and horse's tracks leading from Crawford's camp to Mr. Moore's cabin; I believe them to be the tracks of Crawford. There is a cabin on the northeast of Buffalo Mountain, where there was someone, but seeing me coming they left. I had heard a shot fired long before I got there. When I reached the place I saw about 100 head of elk all around Buffalo Mountain, looking as if they were hunted very much. Followed trails all around and could find no signs of any game having been killed, so returned to camp. Game seen during patrol: 200 antelope on Gardiner Flat and on the east slope of Mount Everts; about 200 elk on east and west of Buffalo Mountain. Weather, normal. Traveled about 25 miles.

February 3.—Left camp at 9.30 a. m. Made a patrol on the north boundary line and to Reese Creek and to a prospector's cabin; no signs of anyone having been there of late. I had Private Weston patrol the east of Mount Everts and look at the deer that was poisoned. He found two foxes, which were poisoned, and were destroyed by crows picking holes in their heads; he also saw 30 bull elk on the south slope of Mount Everts and 400 cow elk on the east slope of Mount Everts, and 4 mountain sheep on the ridge of Everts. Game seen during the day: 100 head of antelope on Gardiner Flat and 50 head of elk on the west side of McMahon Creek, and 6 mountain sheep on the east of Mount Everts. Weather, blowing northwest and light snow. Traveled about 20 miles.

February 4.—Left at 9 a. m. Made a patrol on Crevasse Mountain to meet Scout Whittaker, which I failed to do on account of snowdrifts. My patrol would be to Mr. Knowles's cabin to leave a note for the scout. Also my horse was very lame and could not make it to Mr. Knowles's cabin and then to my camp, so I returned to camp. On my return I saw the poachers' cabin on Buffalo Mountain. I went over to it. There was a fire burning inside, but no one at home. I looked all around and saw some mink skins and what I thought to be fox skins. Waited to see if anyone would show up; then it was getting dark, so I returned to camp. Game seen, 200 antelope on Gardiner Flat. Private Weston made a patrol on Turkey Pen Trail, and also went to the top of the mountain northeast of Turkey Pen Trail. He saw 11 mountain sheep on the mountain. Two of them he said were rams, which he said were last spring lambs, and the remainder of them very small. He also stated that he believes all the big rams are killed off. Private Weston saw 200 elk west of Turkey Pen Trail and 100 antelope on Gardiner Flat. I believe there is more poaching done around here than any other part of the park, outside of Snake River and Riverside. There is a variety of game in this part—1,000 elk, 300 antelope, 200 blacktail deer, about 40 mountain sheep, and plenty of foxes, beaver, and mink. Weather, fair. Traveled about 30 miles.

February 5.—Private Weston left camp at 9.30 a. m.; made a patrol on the north boundary line and to Reese Creek. Said he saw no signs of anyone having been there since last patrolled. Game seen during his patrol, about 200 antelope on Gardiner Flat, 1 that was crippled on the west side of Gardiner River, 20 head of elk on Reese Creek, and 15 blacktail deer on Reese Creek. He traveled about 15 miles.

I left camp on the same day about 11 a. m.; made a patrol on Turkey Pen Trail and on Mount Everts. Travel very bad on account of snowdrifts. Game seen during patrol, about 40 elk on the slope south of McMahon Creek, 7 blacktail deer on the ridge of Mount Everts, and 6 mountain sheep on the west of Mount Everts. Found 1 fox that had died from the poisoned deer meat. No signs of anyone having been there since last patrol. Weather, mild. Traveled about 10 miles.

February 6.—Left camp at 9 a. m.; made a patrol on Turkey Pen Trail and to Cooke City road. Game seen, about 200 elk on the west side of trail and 1 mountain sheep on the mountain northeast of the trail, and about 200 antelope on Gardiner Flat. Sent Private Weston to the post to get one day's rations. No signs of anyone over the trail since last patrol. Weather, chinooky. Traveled about 16 miles.

February 7.—Left camp at 9.30 a. m.; made a patrol on the north boundary line. Scout Whittaker and I saw signs of blood on the trail leading to the line of the park; looked as if it was meat that was taken but the night before. Saw fresh tracks of a man and horse leading to the park; heard one shot fired close to the line. Also made a patrol on Reese Creek. Saw no signs of anyone having been there since last patrol. Weather, chinooky. Traveled about 12 miles.

[Scout Whittaker, 1898.]

February 8.—Reported to Captain Erwin for duty. Attended court at Commissioner Meldrum's house—Tom Miner case.

February 9.—Attended court again on Tom Miner case. Weather, clear.

February 10.—Attended court until 11.30 a. m., when trial was over. Prisoner found guilty of killing an elk in the park. Took Private Martin and all the pack mules out in the afternoon for practice. Weather, clear.

February 11.—Left post, mounted, with Private Root to make a patrol along north line of park, via Gardiner and Cinnabar, and try to locate Scotty's camp; found it on Trail Creek. Returned to post at 5.30 p. m. Weather, cloudy.

February 12.—Remained in the post.

February 13.—Took Private Murphy and left post, mounted, to make a patrol on Mount Everts. Returned to post at 5.45 p. m. Weather, cloudy and very windy.

February 14.—Remained in the post.

February 15.—Left post with Sergeant Wall, mounted, to make a patrol to Buffalo Creek and Mount Everts. Returned to post about 4.45 p. m. Left Sergeant Wall out on Mount Everts until about 7 p. m., when he should return to the post. He returned about that time.

February 16.—Reported to Captain Erwin at 9 a. m. for orders, but it was storming so hard at that time could do nothing. Storm ceased about 10.30 a. m. Received orders at that time to take Sergeant Wall and Private Weston with seven days' rations and leave post after dinner. Left post at 2.30 p. m.; put Sergeant Wall in camp, and returned to post with the mules. Weather, very stormy.

February 17.—Remained in the post.

February 18.—Left post with Private Slough, of D Troop, and Privates La Mont and Martin, of H Troop, with five days' rations and five pack mules, to make a patrol to Hellroaring Creek. Saw about 300 elk between forks of Gardiner River and outlet of Big Blacktail Creek. The beaver in this creek have not been molested. Saw 3 deer on east end of Mount Everts; 6 deer on north side of Yellowstone River, opposite camp. The snow was not very deep, except a few drifts. Weather, cloudy.

February 19.—Stayed in camp until 12.30; then went up the river with Private Slough to look for sheep sign. Sent Privates La Mont and Martin back to post with 2 mules, Private La Mont to return to camp after they got to Blacktail Lake. He saw about 75 elk and 4 deer. Weather, clear.

February 20.—Left camp with Private Slough and Private La Mont, and went down to Crevasse Creek to see if any one had been there, but saw no sign of anything having been done there since I was there last time. Mr. Knowles informed me that there have been all of 2,000 elk in sight at one time near his place, in the last fifteen days. I saw 26 elk on the east side of Crevasse Creek, one-half mile north of Mr. Knowles', inside the park. The elk seem to be working up very high and back towards the Hellroaring district. Saw 14 deer, 6 whitetail and 8 blacktail on opposite side of the river from our camp. The snow is not very deep anywhere yet, except on Crevasse Mountain. Saw one scabby elk near the ford on Oxbow Creek. Weather, clear and very warm.

February 21.—Left camp with Private Slough and Private La Mont. Rode up to south end of Cottonwood Basin to look over the sheep range and see if they were still there, but after looking over it carefully I could not see a single fresh sign of any sheep. I presume they have moved to some other range. Saw 5 whitetail deer near mouth of Cottonwood Creek. Saw about 1,000 elk between the ford and south end of Cottonwood Basin; also, found 3 calf elk that had been killed by mountain lion, there being fresh tracks of such animals around the carcass of each elk. Weather, stormy.

February 22.—When we woke up this morning we found all of our mules gone, but still had the troop horses left. We rode them after the mules, and found them about 2 miles from camp. Returned to camp, packed up, and proceeded to Sergeant Wall's camp. After we arrived there I received orders from Captain Erwin, through Private Weston, to investigate the killing of a deer about 1 mile above the Government ice lake. I found said deer and also the carcass of an elk. The deer had been shot, but the elk, in my opinion, had been killed by coyotes. I came into the post with Private Weston and Private La Mont, and reported the same to Captain Erwin, who gave me orders to remain in the post over night and return to Sergeant Wall's camp to-morrow morning, leaving Privates Weston and La Mont in the post. Saw 17 blacktail deer near mouth of Blacktail Creek, 6 on Mount Everts, 18 just above the Government ice lake. Saw about 250 elk on Mount Everts, and 7 coyotes same place. Weather, clear.

[Sergt. M. J. Wall, 1898.]

February 16.—Left camp at 4 p. m., to patrol the Gardiner Flat and portion of Turkey Pen. Found no signs of anyone crossing the Gardiner River. The antelope were on Gardiner Flat in small bands, from 10 to 15 in each band, and seemed to be

more wild and uneasy than ever. On my return I crossed Gardiner River and found about 150 in one band on the west side of Gardiner River, about 400 yards from Gardiner City, very much watched by the so-called citizens of Gardiner. Two men had guns; one of them Mr. Mack, the other was a stranger to me. There was also about 300 head of elk on the northeast slope of Mount Everts. Weather, cold and light snow. Traveled about 10 miles.

February 17.—Left camp at 10.30 a. m., and patrolled Buffalo Creek and Buffalo Mountain, and followed boundary line to where it crosses the Yellowstone River. Myself and Private Weston went to the camp of Crawford, which was supposed to be occupied by John Dewing. It was found deserted, and there was no evidence of its having been used by anyone lately. The cabin on north side of Buffalo Mountain is still used by parties, but have found no evidence of game being killed across park line, nor no new trails leading into park. Saw 5 blacktail deer on Buffalo Creek and signs of elk on Buffalo Mountain. Returned to camp at 6 p. m. Weather, cold. Traveled about 16 miles.

February 18.—Left camp at 9.30 a. m., and patrolled Reese Creek and north boundary line, myself and Private Weston. On going through Gardiner, a man joined us on the road, and told me there were parties going in there, but if I would watch it that night I would catch them coming out. I afterwards found his name out and asked those men's names, which he said he did not care to tell. I also found out that he was putting me on the wrong trail. Game seen, 6 blacktail deer on the west side of Reese Creek and 1 cow elk, which was wounded in the shoulder. She was then traveling up Reese Creek. Weather, cold. Traveled about 15 miles.

February 19.—Left camp at 10 a. m. and patrolled Trail Creek Mountain with Private Weston; also to find Crawford's camp, but could not locate it. Was told he had taken a load of meat out to Horr, and on my return myself and Private Weston went to Horr to find out if it was so. I was told he was not bringing his meat to that town. I saw Crawford there on the same day. Game seen: About 250 elk on slope of Mount Everts and 200 antelope on the west side of Gardiner River. Returned to camp about 6.30 p. m. Traveled about 20 miles. Weather, cold.

February 20.—Left camp at 10 a. m. and patrolled Trail Creek and also went to the town of Horr. I had sent Private Weston to Mount Everts, to find out if he could see the sheep on the regular range, but he could not see any signs of them. He thinks they have left Mount Everts. When I got to Horr I saw the said Brundage, and Dewing, and Drummound (a man who is a stranger to me), and Brundage's pack horses standing outside Mr. Welcome's saloon. Brundage had made a remark to the strange man, "I am ready, as I am out of meat and money, and we must go to-night." I heard him say, "We will go towards Reese Creek." After they had left I sent a telegram to the post for two men to report to me at Horr. Sergeant Alexander and Private Palmer reported to me. We waited until towards morning, then left for Reese Creek. We patrolled every place we thought we could find them, but failed to do so; then we thought they were notified. Returned to camp about 7 a. m. and Sergeant Alexander and Private Palmer returned to post. Weather, cold. Traveled about 28 miles.

February 21.—Private Weston left camp at 7 a. m. Made a patrol on the north boundary line and also up towards Ice Lake. Hearing shots fired, he went in that direction, and found one blacktail deer dead, about 1½ miles southeast of Ice Lake. He returned to camp, and not finding me there, waited for my return. I was making a patrol on Gardiner Flat. When I returned he reported it to me. Game seen by Private Weston: 50 head of elk on the west side of Gardiner River. Game seen by myself: 12 head of antelope on Gardiner flat. Weather, fair. Private Weston traveled about 12 miles; I traveled 4 miles.

February 22.—Left camp at 9.30 a. m. with Private Weston. Went to the place where Weston had seen the dead deer. We thought the best thing to do was to skin the deer and send Private Weston to the post to report to the commanding officer, which he did. I waited around there for some time to see if anyone would show up, but no one came, so I returned to camp. On my return I found Scout Whittaker and his party in my camp, and Private Weston returned from the post, with orders from the commanding officer for all to return to the post. Scout Whittaker told me he would leave me and Private Slough in camp until further orders. Game seen: 200 antelope on the west side of Gardiner River. Weather, fine. Traveled 8 miles.

February 23.—Left camp at 11 a. m. On my way I met Private Martin, and he told me to report to Scout Whittaker, myself and Private Slough, which I did; and he told me to take Sergeant Alexander and Private Lefler to the place where the deer lay, which I did; and then I was to report to Scout Whittaker, to find out where all the shooting was done which we heard. We could not find out, so we returned to camp about 9.30 p. m. Game seen: About 200 antelope on west side of Gardiner River; 14 elk around Ice Lake. Weather, fine. Traveled about 18 miles.

February 24.—Packed up all property and sent Private Martin to the post with

pack mules. I left camp at 10 a. m. to make a patrol to Horr, which I did, and meeting Mr. Welcome, he told me if I would lay for Brundage I would catch him. I returned to Cinnabar, and meeting Scout Whittaker, I reported to him what I had heard from Mr. Welcome. Scout Whittaker sent Private Slough to the post to find out what to do. Scout Whittaker told me to go as far as Mr. Shields's ranch and he would send me a man, which I did, and couldn't find any trail of Brundage, so I returned and found Scout Whittaker and Private Slough at Yellowstone Bridge, where Scout Morrison joined us shortly afterwards; then all returned to the post about midnight. Game seen: 7 blacktail deer. Weather, cold. Traveled about 30 miles.

[Scout Jas. G. Morrison, 1897 and 1898.]

November 24, 1897.—Left the post with Privates McReynolds and Miller to go over on the Gallatin. On account of deep snow we got no farther than the pocket on Fawn Creek, where we camped. Saw about 750 elk; also numerous signs of beaver on the Gardiner River and Fawn Creek. Distance traveled, about 12 miles.

November 25.—Took back trail down Fawn Creek about 4 miles; thence south along Quadrant Mountain to Indian Creek and up it about 4 miles to snowshoe shack, where we camped. Saw about 150 elk. Many signs of beaver on this creek. Distance traveled, about 15 miles.

November 26.—Remained in camp; scouting up Indian Creek. No signs of game. Distance traveled, about 10 miles.

November 27.—Proceeded to the post. Distance, 12 miles.

February 14, 1898.—Left the post, accompanied by Corporal Ornes and Private Rompre, at 9 a. m. for Soda Butte. Arrived at Yancey's at 4 p. m. Saw about 800 elk. Warm and snow. Distance, 20 miles.

February 15.—Left Yancey's at 9.30 a. m.; arrived at Soda Butte at 4 p. m. Saw about 500 elk. Distance traveled, 15 miles. Warm and pleasant.

February 16.—Remained at Soda Butte on account of very severe snowstorm. Warm and snow.

February 17.—Party, consisting of Corporals Ornes and Herb and Privates Edwards and Rompre, left station, mounted, for Mirror Plateau, following trail up East Fork of Yellowstone. The snow was too deep south of Miller Creek, so made camp south of it about one-fourth mile. Snow 2½ feet deep. Saw about 100 elk on north side of Cache Creek; a great number of Elk signs all the way up to Miller Creek. In Cache Creek bottom saw signs of blacktail deer, but saw only 1, a doe. Distance, 13 miles. Clear and very cold.

February 18.—Left camp with Corporals Ornes and Herb for Ponuntpa Springs on skis, following right bank of East Fork to within a mile of Timothy Creek, up Timothy to near its head, and camped. Snow about 3 feet, very loose, and skiing very hard. Saw a number of mountain-lion tracks; also much beaver sign on Timothy Creek. Distance, about 10 miles. Privates Edwards and Rompre remained in camp. Mild; snowing all day.

February 19.—Following to head of Timothy and down Pelican Creek about 4 miles; thence across to Broad Creek, up it to hot springs near Fern Lake, arriving there about noon. Leaving Corporal Ornes to make camp, Corporal Herb and myself left for Ponuntpa Springs to look for buffalo. Found numerous signs of buffalo all around the spring and on both sides of Sour Creek. Followed them down Sour Creek to where a hot creek came down from a hot mountain on the north side, which they went up, and a close examination of the trail which they made going west to Hot Creek (the trail was not made in single file, but band was spread out). I estimated the band as follows: 4 calves, 8 bulls, about 8 or 9 cows, but think some of the signs which I took for cow signs may have been made by two-year-old bulls; in all 21 head. Ponuntpa Springs is an ideal wintering place for the band which is there, as there is no snow to speak of on the flat, which is about a mile long and three-fourths wide, and is covered with hot springs and hot creeks. The snow on Mirror Plateau is about 5 feet. Mild and fair weather. Distance, about 12 miles.

February 20.—Returned to camp on East Fork as went up. Temperature, mild; weather, fair. Distance, 18 miles.

February 21.—Entire party with pack train left for station (Soda Butte). Saw a few elk, also numerous signs of lynx on Cache Creek and Calfee Creek. Distance, 13 miles. Weather, stormy; temperature, mild.

February 22.—Left Soda Butte for Yancey's on return to post. Saw about 1,000 elk. Weather, fair; temperature, mild.

February 23.—Left Yancey's for post. Saw about 450 elk. Weather, fair; temperature, mild. All the game seen on this trip was in excellent condition for this time of the year.

February 25.—Scout Whittaker and myself left the post to patrol north line and locate Brundage's camp, and see if he had elk meat in his possession. Found that he had left his camp, but could not locate him. Saw about 400 antelope on flat in

front of Gardiner; 3 blacktail deer on road to same place. Went from Gardiner to Brundage's camp on Eagle Creek, from there down Trail Creek to Horr, up Yellowstone River to Cinnabar, and thence by road to post. On the head of Trail Creek we saw James Forsyth and Frank Bezere with a wagon load of elk meat; followed the back trail, and found where they were killing, on Eagle Mountain, about 1½ miles northwest of Gardiner. Weather, clear; temperature, mild. Distance, 25 miles.

February 26.—Scout Whittaker and myself left post to scout north line and meet train at Cinnabar. Saw 6 blacktail deer, 18 whitetail deer, about 400 antelope, and 4 elk. Weather, clear; temperature, mild. Distance, 17 miles.

[Scout Whittaker, 1898.]

February 23.—Left post with Private Martin and 2 pack mules, with grain for camp on McMahon Creek. After proceeding about 1 mile north of post I distinctly heard two shots fired near the north point of Sepulchre Mountain. I sent Private Martin on to camp, while I returned to post to inform Captain Erwin of the shooting I heard. Two men were detailed at once to go with me and see what had been done, or if anything had been killed. I took Sergeant Alexander and Private Lefler, of D Troop, and proceeded to the Government garden, where I met Sergeant Wall and Private Slough. I sent Sergeant Wall with Sergeant Alexander and Private Lefler and told him to put them on a hill above the Government Ice Lake, then come down where I was going to stop. I took Private Slough and patrolled along north line of the park to Gassert Creek, where I found the trail of a horse leading into the park; followed it, and saw where a man had dismounted from his horse and walked around awhile, then mounted his horse again and rode towards Cinnabar. I stayed out until 10 p. m., then returned to Sergeant Wall's camp. Sergeant Alexander returned to the post about 7.30 p. m. Saw about 300 elk near north point of Sepulchre Mountain; about 50 antelope on the Gardiner Flat. Weather, clear and warm.

February 24.—After packing up the mules I sent Private Martin to the post with them, while I took Private Slough and Sergeant Wall and patrolled the north line to Reese Creek. When I got to Cinnabar I was informed that Brundage was coming into Horr with a load of elk meat. Not knowing just what to do I sent Private Slough to the post with a letter to Captain Erwin for orders in this matter. About 7 p. m. I met Scout Morrison and Private Slough with orders from Captain Erwin to watch for Brundage and see if he had any meat in his possession. I sent Scout Morrison and Sergeant Wall to Trail Creek, while I watched the bridge at Gardiner. We stayed out until about 11 o'clock, but saw nothing of Brundage, and decided to return to the post. We arrived at the post about 12.30 p. m. Saw 14 elk back of Gassert ranch. Weather, clear and warm.

February 25.—Left post with Scout Morrison to make a trip to Eagle Creek and see if we could locate a band of 21 sheep, which were reported to have left the park. We saw nothing of them, but about 1 o'clock p. m. we came onto two men, Frank Bezere and James Forsyth, with a wagonload of elk meat, which had evidently just been killed. Frank Bezere asked us not to put him on the road for having the meat in his possession. We did not say anything, but went to Trail Creek, then to Horr, where we wired Captain Erwin about the meat we had seen. Then we proceeded to the post. Saw about 400 antelope at Gardiner, inside the park. Saw 6 deer near the post and 11 near the Government ice lake. Weather, clear and warm.

February 26.—Left post with Scout Morrison to patrol north line as far as Reese Creek. Went to Cinnabar. When train arrived, met Game Warden James F. Keown, who came up to arrest Bezere and Forsyth. He went to post to remain over night. We returned to post about 5 p. m. Saw about 350 antelope near Gardiner. Weather, clear and warm.

February 27.—Scout Morrison, State Game Warden James F. Keown, Sergeant Wall, Private Rompre, and myself left Fort Yellowstone to look for A. K. Crawford's camp and anybody that was violating the game laws. Mr. Keown and Scout Morrison went to Eagle Creek, while I took Private Rompre and Sergeant Wall and went down to Cedar Creek; scouted around there until about 4 p. m., then went to Cinnabar and remained over night. Mr. Keown and Scout Morrison returned to post. Saw 6 deer near the Government ice house; one had its front leg broken; I presume it was done while running. Weather, cloudy and warm.

February 28.—Received orders from Scout Morrison to meet himself and Mr. Keown at Gardiner with buckboard. We met there at about 9.30 a. m. After I saw Mr. Keown I told him I thought I could get him another case on Reese Creek if he could get along without me. He told me to go by all means and try to catch whoever was doing hunting at that place. I left Sergeant Wall and Private Rompre in his charge. After I got to Reese Creek I found the footprints of two men leading into the park, but could not find where they had done anything. I followed the tracks until about 3.30 p. m., when I saw the two men following a lot of elk trails that were there. I asked them if there was any game there. They said "Yes," but they could not find it. I started to go home, and after I went about 400 yards they started to follow

me out. I suppose they were going back to the coal banks where they were from. I returned to the post about 5.30 p. m., and reported all the doings of my trip to Captain Erwin. Weather, cloudy and warm.

March 1.—Remained at post. Weather, cloudy and warm.

March 2.—Received orders to go to Livingston with Scout Morrison, in response to a telegram from State game warden to Captain Erwin, the acting superintendent of the park, to give our testimony in the Frank Bezere elk-killing case, which case was set for 6 o'clock p. m. On our testimony the accused was held for next term of district court. Said court convenes some time in the month of April. Weather, clear and warm.

March 3.—Returned from Livingston to Fort Yellowstone with Scout Morrison and reported for duty. Weather, cloudy and cold.

March 4.—Reported to Captain Erwin, the acting superintendent of the park, at 9 a. m., and received orders to take two men and eight days rations and work in the Reese Creek district, and as far east as the Gardiner River. At about 2 p. m. left post with Privates Rompre and Martin of H Troop, and Private Slough of D Troop, and four pack mules. Proceeded about 7 miles north of post and pitched camp at the north point of Sepulchre Mountain. After making camp I sent Private Martin back to post with all the mules. Saw about 250 antelope near Gardiner City; also saw a herd of 11 horses about 1 mile south of north line. Weather, cloudy and stormy.

March 5.—Left camp with Privates Rompre and Slough and patrolled the north line as far as the Gassert ranch; then I sent Privates Slough and Rompre back to camp, via Cinnabar, with orders to come to Reese Creek if I did not return to camp by 4 p. m. After leaving them I went to the McMahon ranch, on Reese Creek, to see if anybody was up there hunting, but learned that nobody had gone up there since last Tuesday. On that day two men brought out 1 elk, could not tell just where it was killed or who the men were, but they belonged in Horr. Saw about 75 antelope between Gardiner and Chadbourne's ranch, just outside the park, but they came back in the park towards evening. Saw 1 large bull elk near our camp. Weather, clear and very warm.

March 6.—Left camp with Private Rompre to patrol the north line as far as Reese Creek, and stayed there until 8.30 p. m., then returned to camp. Sent Private Slough to patrol east as far as the Gardiner River. He saw about 200 antelope near Gardiner, but inside the park. I saw about 50 near the Chadbourne ranch, outside the park, but they returned toward evening. There has been nobody on Reese Creek since Thursday night. The snow is going very fast on this creek. Weather, clear and very warm.

March 7.—Left camp with Privates Rompre and Slough to round up a herd of 9 horses that have been running on the park and send them into the post. After I got them started I let Privates Rompre and Slough take them to the post, while I patrolled the north line to Reese Creek again. After I got to Reese Creek I went down to Horr to see if I could find out anything about "Scotty" Crawford or Brundage, but I did not succeed in getting any information of Brundage. But "Scotty" was in Horr last night; I was told that he had given up hunting for meat. I went back to Reese Creek and remained there until 5.30 p. m., when it began raining so hard that I decided to return to camp, there being no sign of anybody up there to-day. Privates Slough and Rompre report seeing about 250 antelope near Government ice lake; they saw 8 deer near our camp. I saw 13 back of the Gassert ranch—all blacktail. They must have just moved in there; it is the first time I have seen them there this winter. Weather, cloudy and warm; wind blowing and raining in afternoon.

March 8.—Left camp with Private Slough and patrolled along the line to the Gardiner River, thence back to camp. Remained in camp until about 6.30 p. m., then started down to lay at Reese Creek. When I got there found out that there had been nobody up there, yet I returned to camp about 11 p. m. While in Gardiner learned that Brundage had been there yesterday, but did not bring in any meat. He returned to his camp last night. I saw about 350 antelope near Gardiner, but inside the park. I saw about 50 last night when I was coming back to camp from Reese Creek, along the road between Gardiner and Cinnabar, just above the Chadbourne ranch, but nothing seems to molest them. About 2 inches of snow fell here last night. Weather, cloudy; cold wind blowing all day.

March 9.—Left camp with Private Rompre to make a patrol to Reese Creek. I sent Private Slough to patrol to McMahon Creek, on Mount Evarts. When I got to Cinnabar I wrote Captain Erwin, the acting superintendent of the park, a letter requesting that I be allowed to remain in camp until Sunday night; also wrote a letter in regard to "Scotty" Crawford, but later I learned the information was false and wired the same to Captain Erwin. Towards evening I went to Horr. I remained there until 5.30 p. m., then went up to Reese Creek. There was nobody up there. I layed along the Yellowstone River until about 7.30 p. m., then I went to Cinnabar

and remained there until 9 p. m., then returned to camp. While at Horr learned that Brundage had a contract to furnish elk meat to a certain party, for a debt he owes to said party, to the amount of 1,500 pounds. Also saw two men come in with guns and a rope which had blood on it. Don't know where they came from. Saw about 75 antelope near Gardiner, inside the park, 12 deer back of Gassert ranch. Private Slough saw about 100 antelope on the McMahon bench at north point of Mount Evarts. A. K. Crawford went up to Bear Gulch to-day. Weather, cloudy and cold; wind blowing.

March 10.—Sent Private Slough to Reese Creek while I took Private Rompre and went to the post to report to Captain Erwin and see if I could return to camp and remain until Sunday. My request was granted, and I took two days' rations and Private Martin, with one pack mule, and returned to camp at 5 o'clock p. m. Sent Private Martin back to post with the mule. I saw about 100 antelope near Gardiner, about 100 on Mount Evarts, 2 deer on Mount Evarts, 6 on the Government dump, 9 near the Government ice lake, all blacktails. Saw 10 mountain sheep on Mount Evarts, near McMahon coal bank. Weather, cloudy and cold; wind blowing. About 6.30 p. m. Private Slough and myself met "Scotty" Crawford's partner going towards Gardiner with one pack horse loaded with grub. He went up to Bear Gulch.

March 11.—Sent Privates Rompre and Slough to Reese Creek while I made a patrol to the Gardiner River, thence back to camp. I saw nothing on my trip, but Rompre reported seeing 1 large bull elk on Reese Creek with one hind leg broken. About 4 p. m. decided to go to the post and ask Captain Erwin to let Scout Morrison come down to-morrow and go with me to Eagle Creek and see where "Scotty" Crawford's partner had gone to. I left the post again at 7.15 p. m., and patroled the road back as far as Chadbourne's ranch, then returned to camp. I saw 15 black-tail deer on river bed, just opposite the Boiling River, 9 white-tail deer near the Government ice house, 57 antelope on west slope of Mount Evarts, just opposite the Boiling River. Captain Erwin told me he would have Scout Morrison meet me to-morrow. Weather, stormy and cold.

March 12.—Sent Private Slough to make a patrol to Gardiner River, then return to camp. After he had returned to camp I sent him with Private Rompre to make a patrol to Reese Creek again, while I went to meet Scout Morrison. I met Scout Morrison about 10 a. m., and proceeded to Eagle Creek; saw nothing there and returned to camp. There I found Privates Rompre and Slough in camp; they reported nothing on Reese Creek. Scout Morrison and myself saw George Mack, of Gardiner, hunting along the north line of the park, about 500 yards west of Gardiner. When he saw us, he came back to the road again and back to Gardiner. We saw about 75 antelope on the east side of Gardiner River, on the Gardiner Flat. Scout Morrison said he saw a great many in the J. C. McCartney field. The 13 deer that were back of the Gassert ranch have moved back into the park and up near the ice lake. Weather, cloudy; temperature, mild.

March 13.—Started out from camp on foot with Private Rompre to watch a small band of antelope near the north line, about 400 yards west of Gardiner. I saw two men near the line. Both of them had guns and were evidently hunting. I watched them until they returned to Gardiner. One of them fired two shots, but I could not see where he had killed anything. One of them was George Mack, of Gardiner. I returned to camp about 12.30 p. m., and found Private Martin had just arrived with the pack mules. I packed them up and sent him back to the post with Private Slough about 1.30 p. m., then took Private Rompre and went to Reese Creek. There had been nobody up there since I made camp here. I returned to the post about 7.30 p. m., and reported everything to First Lient. G. O. Cress, the commanding officer. I saw about 300 antelope near the road about 400 yards west of Gardiner and outside the park. I reported the fact to Lieutenant Cress, who detailed 2 men to patrol the line to-morrow morning. Also saw about 150 on east side of the Gardiner Flat. Weather, very cold and stormy. About 4 inches of snow fell in our camp last night and to-day.

March 14.—Left the post with Lieutenant Arnold and 17 privates to shovel out the Golden Gate. Did not have much trouble in getting to the Gate, and it only took about three hours to get through the Gate. For about one-half mile from the Glen Creek Bridge we had to shovel a great deal of snow. Then it was easy to get to the Klamer cabin. From there on saw about 100 elk in the vicinity of Swan Lake Flat. Weather, stormy and cold.

March 15.—Left post and went to Gardiner and overtook 2 men who were sent out early in the morning. I took Private Hoover and sent Private Newman to post; then went along the line to Reese Creek, then came back to Cinnabar; stayed there until about 5 p. m., then started for the post. Saw about 300 antelope near Gardiner inside the park. In the evening saw about 75 near the road outside the park. Saw 17 blacktail deer, 4 in Government garden, 14 near Boiling River. Weather, cloudy and cold; wind blowing.

March 16.—Left the post with First Lient. G. O. Cress, the commanding officer, and

rode up to the McMahon ranche, on north point of Mount Evarts; thence over to Gardiner Flat, then over to the J. C. McCartney field, then to the post via Government garden. Saw 1 blacktail deer near the Government ice house, 1 whitetail deer at the crossing of the old road over the Gardiner River, about 25 antelope on the west slope of Mount Evarts, almost opposite the Boiling River, and between 150 and 175 in the vicinity of Gardiner Flats and about 50 near the J. C. McCartney field. Saw 8 mountain sheep on the bluff near the Eagle's Nest, 5 deer on the west slope of Mount Evarts, opposite the first bridge over the Gardiner River from post. Weather clear and warm. At the Government garden we saw a duck going down the river on its back, and landed on the opposite side of the river. I then went over and caught it and found it bleeding from the head. Saw some fresh beaver sign just below the first bridge over the Gardiner River north of the post.

March 17.—Left the post with Lieutenant Hawkins to make a patrol to Reese Creek, then back to the post. Saw about 150 antelope in the vicinity of Gardiner Flat and north point of Mount Evarts, and about 150 west of Gardiner, some outside the park and some inside. Saw 10 mountain sheep on Mount Evarts, 24 elk near Government ice lake. Mr. McMahon informed us that some meat had been taken out yesterday. Weather, clear in the a. m. and cloudy in the p. m.

March 18.—Remained in post. Weather cloudy.

March 19.—Left the post with Sergeant Alexander, of D Troop, and Private Boniface, of H Troop; proceeded 7 miles north of the post and went into camp in my old camp at the north point of Sepulchre Mountain for three days. Saw about 50 antelope above the Boiling River on the east side of the Gardiner River, 29 near the first bridge over the Gardiner River north of the post, 11 blacktail deer about the same place, 2 at the Government garden, 9 near the Government ice lake. Arrived in camp about 7.30 p. m. Weather, stormy and cold.

March 20.—In the morning I took Sergeant Alexander and went on top of a high hill so we could see everything that took place on the north line of the park, between Gardiner and Reese Creek. We saw nothing up to 12.30 o'clock p. m. and returned to camp and left for Reese Creek about 5.30 p. m. There had been nothing up there since my last trip, which was on the 17th instant. We saw 8 deer near the Gassert ranche. Saw about 50 antelope one-half mile west of Gardiner and about 500 yards north of the park line. We returned to camp about 8.30 p. m. Weather, cloudy and cold; wind blowing.

March 21.—Left camp on foot with Sergeant Alexander and went almost to the park line to look for the antelope, but owing to the inclement weather we could do nothing, so we returned to camp until about 4.30 p. m. We then took our horses and rode along the park line as far west as the Gassert ranch, but saw nothing, so we returned to camp. It was almost impossible to do anything on account of the intense cold. We saw 3 blacktail deer about 300 yards north of our camp; 10 elk about 700 yards east of camp; all inside the park. Weather, stormy and very cold.

March 22.—Left camp with Sergeant Alexander and patrolled the north line as far as Reese Creek, thence back to camp. We left camp about 3.30 p. m. and went to Fort Yellowstone. Saw nothing on Reese Creek. Game seen to-day, about 150 antelope about 400 yards north of the park line and about one-half mile west of Gardiner; 3 blacktail deer one-fourth mile north of our camp; 19 blacktail deer near the McMahon coal bank on north point of Mount Evarts; 6 near the Government ice house one-fourth mile north of the post; 25 elk about one-half mile east of our camp; about 300 elk on Mount Evarts near the McMahon coal bank. Arrived at post 6.30 p. m. Weather, clear; very cold at night and warm during the day.

March 23.—Left the post with Private Murphy, of D Troop, on snowshoes and went around Mount Evarts down Rescue Creek to Blacktail, thence back to post. Saw about 125 elk on east end of Mount Evarts; 6 mountain sheep same place. Weather, cloudy and cold.

March 24.—Left the post, mounted, about 10 a. m. to make patrol to Reese Creek, then back to post. Saw 3 men near the outlet of Gardiner River; think they were fishing, but could not swear to it. Saw about 125 antelope in the vicinity of Gardiner Flat; 52 on east side of Gardiner River, opposite Boiling River; 23 blacktail deer same place; also 8 near McMahon ranch on Reese Creek. Saw 14 mountain sheep on top of bluff at Eagle's Nest—7 ewes and 1 ram in one bunch and 6 ewes in the other. Saw about 300 elk near the head of McMahon Creek. Weather, clear and chinook wind blowing.

March 25.—Left post, mounted, with Private Palmer, of H Troop, to make patrol along north line to Reese Creek, thence back to the post. Left post 10.20 a. m., returned 4.10 p. m. Saw about 75 antelope on Gardiner Flat; 6 blacktail deer about 300 yards east of the post sawmill. Went to Reese Creek, but saw nothing there; the weather was too stormy to see very far off. Weather, stormy; light snow falling all day but not very cold.

March 26.—Left the post with Private Bledsoe, of D Troop. Went to the outlet of Gardiner River, then west along the park line to Reese Creek. At Gardiner I

found a fresh foot track leading into the park; followed it and found it to be Thomas Newcomb, but he had no arms with him. On the road to Gardiner I saw 4 mountain sheep at the Eagle's Nest. Saw about 75 antelope on the Gardiner Flat; about 150 400 yards west of Gardiner but inside the park; 13 blacktail deer near the Government ice house; 4 at the Government garden. Weather, stormy and cold.

March 27.—Remained in the post. Weather, clear; temperature, cold.

March 28.—Left the post to patrol to Reese Creek, but before I reached there I came across 2 footprints of men going towards the park and I decided to come up Reese Creek, then go back and follow the tracks. There was nobody on Reese Creek to-day. On my return I took up the trail of the 2 men. Had some difficulty in finding it once in a while, but I finally struck it where the snow was deep and found that there were 3 men instead of 2, and that they had gone about one-half mile into the park and there shot and killed 1 cow elk, and it looked as if they had wounded 2 others. They took the meat out last night. There were tracks of 2 men hunting along the line, but they did not get inside the park. I saw 7 mountain sheep at Eagle's Nest; 37 antelope on the west side of Gardiner River; about 75 at the junction of the Gardiner and Yellowstone rivers; about 250 1 mile west of Gardiner, and about 300 yards north of the park line saw 35 blacktail deer, between the Government ice lake and Gardiner River; 4 near the Eagle's Nest; 4 at the two-mile post north of the post; 6 whitetail at the Boiling River; 5 in the Government garden. Weather, clear; temperature, mild.

March 29.—Left the post with Lieutenant Lindsley; went to Gardiner City, then to Cinnabar, then to Horr, then back to where the elk were killed yesterday, then back to the post. Saw 42 elk on the north slope of Sepulchre Mountain, about 15 near the Gardiner ice lake; 3 blacktail deer near the Government garden; about 50 antelope on the Gardiner Flat on the north point of Mount Evarts. Weather, clear in the forenoon, cloudy in the afternoon; temperature, mild.

March 30.—Left the post with Scout Morrison, on skis, and proceeded to Norris. Saw no game. At Willow Park we met Corporal Moore, Private Root, and Private Fremont coming in off pass. Weather, cloudy; temperature, mild.

March 31 (12 miles).—Left Norris with Scout Morrison and proceeded to Canyon Hotel. Saw no game on trip to-day. Weather, clear; temperature, mild.

April 1.—Left Canyon Hotel with Scout Morrison and proceeded to Lake Hotel. We took lunch at Mud Geyser Station. Took Privates Price and Canivan with us from there to Lake Hotel, intending to take them to the Thumb, but when we arrived at the Lake we found Sergeant Leob and two privates from Snake River Station. Scout Morrison and myself then decided to make up our trips from here. I am to take Privates Price and Canivan from Mud Geyser and Private Montgomery of Snake River Station, and go up the Upper Yellowstone River, then to Snake River Station, while he would take Sergeant Leob and Private Carter, and we would meet at that place. Saw 2 foxes and 1 coyote in Hayden Valley. Weather, clear; temperature, mild.

April 2.—Left Lake Hotel with Private Montgomery, of the Snake River Station, Privates Canivan and Price, of Mud Geyser Station, and proceeded to Beaverdam Creek. We went from Lake Hotel straight across the Yellowstone Lake to the lean-to on Beaverdam. The lean-to is filled up with gravel and snow so we could not stay in it, but had to camp in the woods near by. At Terrace Point we saw 14 elk and numerous signs of others. Saw 5 dead elk—last spring calves. Saw what I took to be two moose tracks near the east end of the lake on the mouth of Beaverdam Creek. Saw one fresh bear track which was made to-day along Beaverdam Creek. Have seen no signs of beaver at this place yet. Saw no signs of any poaching having been done. Will venture to say there are between 150 and 200 elk between Terrace Point and Beaverdam Creek. Weather, clear; temperature, warm.

April 3.—Same party left Beaverdam Creek and proceeded to the old Crawford cabin near Atlantic Creek. Camped there over night. There was a lynx at the cabin which had killed something and dragged it to the cabin. I think he had killed a lot of jack rabbits or else another lynx and eaten it up there at the cabin. There has been nobody at the cabin since the rations were put there, nor has there been any poaching done in that district this winter. At least there are no signs of any having been done. Saw 13 bull elk near the outlet of Mountain Creek; also saw signs of 6 moose between Beaverdam Creek and Mountain Creek. The Upper Yellowstone River is open in some places. From Mountain Creek to Crawford cabin there is no sign of game of any kind. The snow is too deep to permit any animal to live in it. Weather, clear and warm. Twenty miles.

April 4.—The same party left Crawford Cabin and proceeded to the gold mines on Pacific Creek. Went up Atlantic Creek and down Pacific Creek. We saw no sign of any game until we got to Coral Creek; there we saw one fresh bear track. The snow will average 7 or 8 feet in depth in that country. Weather, clear; temperature, hot. Twenty-one miles.

April 5.—Same party left gold mines on Pacific Creek and proceeded to Snake River Station. Saw no game of any kind. Left gold mines at 8 a. m.; arrived at station at 7.30 p. m. All the game I have seen is in very good condition; I don't think they will have any trouble in getting through the rest of the winter. Weather, clear and warm.

April 6.—Same party remained at the Snake River Station to wait for Scout Morrison and party to return from the Falls River country. Weather, clear and warm, but very stormy towards evening.

April 7.—Party still remaining at station, waiting for Scout Morrison and party. Scout Morrison and party returned from Falls River country to-day. Weather, very stormy, but not cold.

April 8.—Remained at Snake River Station. Weather, cloudy; temperature, warm.

April 9.—Left Snake River Station with Scout Morrison, Sergeant Leob and Private Carter of Snake River Station, and Privates Canivan and Price of Mud Geyser Station, and proceeded to Shoshone Geyser Basin. Camped near the Union Geyser. Saw signs of 6 or 7 elk on Polecat Creek. Weather, clear; temperature, warm. Thirty miles.

April 10.—Same party left Shoshone Geyser Basin and proceeded to Upper Geyser Basin lunch station via Lone Star Geyser. Left camp 4.40 a. m.; arrived Upper Basin 8.30 a. m. Saw no sign of any large game. Saw no sign of anybody having been in that country this winter. Saw one pine marten at Upper Basin. Weather, cloudy; temperature, warm.

April 11.—Same party left Upper Geyser Basin and proceeded to Lower Geyser Basin or Fountain Hotel. Five miles from Upper Basin, on the road to the Fountain Hotel, we saw a trail across the road, and, to the best of my knowledge, it was a trail made by buffalo, but could not tell how many of them had made the trail, it being about three or four days old. I think they were going north; there were at least 3 of them on the trail. Toward Mary's Mountain there are a great many elk signs between the Excelsior Geyser and the Fountain Station. There is a great deal of bare ground between the Upper and Lower Basins and snow is very soft. We had to wade about one-half of the way. We went to the station and remained over night with Corporal Holman. Weather, clear; temperature, mild. Ten miles.

April 12.—Left Fountain Station with Scout Morrison, Sergeant Leob, and Private Carter of Snake River, and proceeded to Norris Station. Stayed there over night. There is about 6 miles of bare ground between Fountain and Norris Basin. Saw a few elk sign in Gibbon Canyon. Privates Canivan and Price left me at Fountain Station to go back to their station at Mud Geyser; they will go over Mary's Mountain and through the Hayden Valley. We arrived at Norris about 8.30 a. m. Weather, clear; temperature, warm. Twenty miles.

April 13.—Same party left Norris and proceeded to Fort Yellowstone. Left Norris at 3 a. m.; arrived at post at 8.10 a. m. Saw no game on road. The snow is going very fast. This entire trip from March 30 to the present day has been made on skis and covers a distance of about 235 miles in all. All the game I have seen is in very good condition. The rations in the Beaverdam and Crawford cabins are in bad condition, except the coffee. The mice and rats have got into the boxes and have eaten up some of them, and what they did not eat they have spoiled. Private Price of the Mud Geyser Station is a very good man to have on such a trip. Private Montgomery went snow-blind at the Crawford cabin and could hardly get to Snake River Station. We had to walk into the post from Golden Gate. Weather, clear; temperature, warm. Twenty miles.

April 14.—Left the post with Scout Morrison, mounted and went to Cinnabar, then back to the post. Saw 36 blacktail deer near the Boiling River; 30 antelope—22 opposite the Boiling River, 8 on the Gardiner Flat. Saw a fire burning about 300 yards north of the park line near the Gardiner Ice Lake. Weather, clear and warm.

April 15.—Left post, mounted, and went around Mount Everts to try and locate the mountain sheep. Saw 7 near the coal bank, 4 on Turkey Pen, 4 on east end of Mount Everts. Saw 65 blacktail deer—7 about 200 yards east of post hospital, 4 on McMahon Creek, 10 on Turkey Pen road, 1 on Red Mountain, 10 on Cooke City road on East Gardiner River, 21 on west slope of Mount Everts, about 600 yards east of Boiling River, 12 opposite the Boiling River. Saw 67 antelope on Turkey Pen road, 27 near the coal banks, 19 opposite Boiling River; 5 bull elk at the top of the Gardiner grade. Weather, clear; temperature, hot.

April 16.—Left post, mounted, and went over old road to Reese Creek. Saw 11 mountain sheep on top of Mount Everts, about 150 antelope on the Gardiner Flat, 7 whitetail deer 1 mile west of Gardiner and about 300 yards north of park line. Weather, cloudy and rainy at Cinnabar; temperature, mild.

April 17.—Remained in post. Weather, cloudy; temperature, warm.

April 18.—Remained in post. Reached pack mules in the forenoon. Weather, clear and warm.

April 19.—Remained in the post. Weather, clear; temperature, warm.

April 20.—Went to Livingston, Mont., with Scout Morrison, on the case of Frank Bezere for killing elk, to give our testimony in said case. Weather, rainy; temperature, cold at Cinnabar.

April 21.—Attended court in Livingston, Mont., to give testimony against Frank Bezere, defendant; he was found "not guilty." Weather, cloudy; temperature, warm.

April 22.—Returned from Livingston, Mont., to Fort Yellowstone and reported for duty to the commanding officer. Arrived at post at 2.45 p. m. At 5.45 p. m., left post with Sergeant Welch and 2 pack mules and went to Gardiner to get some Tom Moore pack saddles; returned to post at 9 p. m. Saw 14 blacktail deer between Boiling River and the Government ice house. Saw 4 mountain sheep at Eagle's Nest, about 150 antelope on the Gardiner Flat. Weather, cloudy and rainy in Gardiner and Cinnabar; temperature, mild.

April 23.—Left the post, mounted, with Sergeant Welch, Private Hemstead and Private Holt of H Troop, and 4 pack mules and 2 lead horses, and proceeded to Norris Station. We left post at 9.45 a. m., arrived at Crystal Spring 1.15 p. m. Left Crystal Spring at 2.10 p. m., arrived at Norris 5 p. m. We made the trip in about six hours travel, which was remarkably good time, this being the first mounted party to make the trip this spring. There was about 5 miles of pretty deep snow, but it was so soft that a horse could pass right through it without much trouble; the rest was easy traveling. Private Helm met us at Bijah Spring. We saw several bear tracks on the road between Twin Lakes and Norris. Weather, clear; temperature, hot.

April 24.—Left Norris, mounted, with Private Hemstead and 2 pack mules and went to the Riverside Station. There was not a great deal of snow on the road in the 26 miles we traveled. We did not go through more than 4 miles of snow, and it was so soft that it was just like going through so much water. The ground is very soft in some places. There is some fallen timber and a great many rocks in the road in Gibbon Canyon; in fact, the road is in very bad condition for a team to get over them before they are repaired. Saw about 50 elk at the forks of the Gibbon and Firehole rivers, 3 fresh bear tracks in Gibbon Canyon, several in Madison Canyon. From Norris Sergeant Welch and Private Holt took 2 mules and returned to the post. I wired the Fountain men to meet me at the forks of the road and take their led horse to their place until I came back from Riverside. I met Corporal Holman in the Madison Canyon going to his station. Weather, clear; temperature, very hot, and does not freeze any at night.

April 25.—Left station with Sergeant Bernstein, mounted, and rode north to Maple Creek, then returned to station. Saw some fresh elk sign in the fallen timber close to Maple Creek. Sergeant Bernstein showed me where 3 elk were killed last December. They were inside the park about 8 miles north of the station, or 1 mile west of north. Sent Private Norvell and Private Will into the post from here, so that they would not have to go to the Fountain. Decided to hold Private Ornes and the mules over to-day; the stock was a little tired. There is no snow to speak of around here or Sand Butte, but the ground is very soft and a horse mires down very easy. It would be very hard for any poacher to get into the park just now. Weather, clear; temperature, hot.

April 26.—Left Riverside Station with Sergeant Bernstein, Private Ornes, and Private Hemstead, and went to Fountain Station. At the forks of the road, I sent Private Hemstead to Norris. Saw a great many fresh elk tracks in Gibbon Canyon. The roads are drying up very fast. There is no snow around this place. Weather, clear; temperature, hot; high wind blowing.

April 27.—When I got up this morning I found my horse and the 2 mules gone; began to look for them and found they had gone to Norris. I saddled up Private Ornes's horse and went after them. It was 11.30 a. m. before I got to Norris. I started back at 1 p. m.; arrived here at 5.10 p. m. I sent Privates Burdette and Stitham on their way to the post and told them to take Private Hemstead with them when they left Norris and I would take Private Ornes and go clear through to the post to-morrow with the pack mules. The wind storm of yesterday did a great deal of damage in the Gibbon Canyon to the telephone line. It is broken in about 25 places and down for about one-half mile in some places and there are at least 100 fallen trees across the road, and the most of them will have to be cut out before a wagon can get through. In my orders for this trip, I was ordered to take Corporal Holman from the Fountain and make a trip on skis up to Bear Parks, stay there over night, and next day go out as far as possible and return to cabin again. Not being able to make the trip at present on account of sickness, I decided to go to the post and report the fact to Lieutenant Lindsley. I could not get any message over the telephone because the wires were down. There has been a band of elk come up the road from the Madison Canyon to the Twin Buttes. There are about 500 elk in this vicinity. One fresh beaver sign in Nez Perce Creek about 2 miles above the station. Weather, clear; temperature, hot. Distance, 40 miles.

April 28.—Left station with Private Ornes and Private Sybert, mounted, with 2 mules and proceeded to Fort Yellowstone. Left Fountain at 7.30 a. m.; stopped at Norris for dinner; left Norris at 1.30 p. m. Saw where 2 elk crossed the road at Crystal Spring, 2 at Obsidian Cliff; several fresh beaver signs in the road between the Fountain and Crystal Spring; 4 Elk on Swan Lake flat. The telephone wire is down very badly all around the park. Very little snow between Norris and the post. Weather, cloudy; temperature, warm.

April 29.—Remained in the post. Weather, cloudy; temperature, mild.

April 30.—Remained in the post on account of sickness. Cloudy, snowing a little; temperature, cold.

May 1.—Remained in the post on account of sickness. Weather, cloudy; temperature, cold.

May 2.—Left post, mounted, with Scout Morrison and made patrol to J. S. Knowles' cabin on the Yellowstone River. Saw about 300 elk near Blacktail Creek; 8 blacktail deer near the outlet of the creek; 5 antelope same place. The beaver on Lava Creek are not working any this spring—at least there are no signs of any work. The beaver in Blacktail Creek are doing some great work at present. They are building some fine dams on the creek, about 1 mile from its outlet. Weather, cloudy; temperature, cold.

May 3.—Left J. S. Knowles' cabin with Scout Morrison and returned to the post. Saw some signs of people fishing on the Yellowstone River above Mr. Knowles' place. They come up from Gardiner and camp over night in an old cabin near Knowles' place and fish from there. We saw 1 man fishing on the river on the east side, opposite mouth of Blacktail Creek; his name was Mike O'Brien, from Gardiner City. Saw 3 dead elk, last spring calves, near the Blacktail ford. Saw about 200 elk on Blacktail; 2 antelope same place. I saw 2 and Morrison saw 6 mountain sheep near mouth of Blacktail. Weather, cloudy and cold.

May 4.—Remained in the post, owing to sickness. Weather, cloudy; temperature, cold.

May 5.—Left post with Scout Morrison, mounted, to make a patrol to headwaters of the Gardiner River and Indian Creek, but could not get there on account of deep snow. Saw about 30 elk near Mr. Klamers slaughterhouse on Swan Lake Flat. Weather, cloudy; temperature, cool.

May 6.—Left post, mounted, with Scout Morrison and 2 pack mules to make patrol to Hellroaring Creek. Camped at the mouth of Cottonwood Creek. Saw 2 men fishing on the Yellowstone River; they had about 30 pounds of fish between them. Saw quite a number of elk in the vicinity of Blacktail Creek. Saw 10 blacktail deer on the Cooke City road along the Gardiner grade. Met Lieutenant Lindsley with pack train at Blacktail Creek on his return to post from Soda Butte Station. Weather, cloudy; temperature, mild.

May 7.—Left camp on Cottonwood Creek and rode over to Hellroaring Creek. Saw 4 whitetail deer and 4 blacktail between Cottonwood and Hellroaring creeks. Found 2 dead bull elk that died this spring, and 7 that I believe were killed for their teeth alone; but they were killed last year if they were killed at all. Weather, clear; temperature, mild.

May 8.—Left camp and returned to the post. Saw about 25 elk on Blacktail Creek; 1 antelope same place; 10 blacktail deer on the Gardiner grade on Cooke City road. The Yellowstone River is very high at present; will be hard to ford from now on. Weather, clear; temperature, warm.

May 9.—Left post, mounted, and went to Gardiner City to get some pack saddles. Returned to post at 7 p. m. Saw 11 mountain sheep on Mount Evarts, opposite Boiling River; 1 at the Eagle's Nest. Weather, clear; temperature, warm.

May 10.—Remained in the post to fix up the pack-train outfit for use. Weather, cloudy; temperature, warm.

May 11.—Remained in the post to work on the pack train. Weather, clear; temperature, warm.

May 12.—Remained in the post on account of sickness. Weather, clear; temperature, warm.

May 13.—Left the post with Mr. A. E. Burns to make patrol on Reese Creek. Mr. McMahon informed me that A. K. Crawford was up on Reese Creek last Sunday. We followed up the creek and saw where somebody had gone up into the park, but they came out again. I presume they were trying to get into the park. We saw 5 deer near the Boiling River. Weather, clear; temperature, warm.

May 14.—Left post, mounted, with A. E. Burns and 1 pack mule, and proceeded to the headwaters of Glen Creek; camped there over night. Saw 6 elk on the west slope of Sepulchre Mountain. Weather, clear; temperature, warm.

May 15.—Left camp on Glen Creek, and went to head of Reese Creek, down said creek to the McMahon ranch, then to the Gassert ranch, then along the foot of Sepulchre Mountain to the post. Saw 13 deer at the old brickyard on the old Gardiner road, 3 near the Transportation barn. Weather, cloudy; hard rain falling around

Electric Peak. There are quite a number of bear signs and fresh elk signs also. There are about 25 head of cattle and a few horses running on the park southwest of Gardiner City. There has been nobody through the Electric Peak Pass yet, but there are some fresh horse tracks along the park line on Reese Creek.

May 16.—Remained in the post on account of sickness. Weather, cloudy and rainy; temperature, cool.

May 17.—Went to Gardiner and returned to the post; saw 3 deer near the old brickyard; intended to start for Yancey's in the afternoon, but the weather was bad, so received orders to wait until morning. Weather, cloudy and rainy; temperature, mild.

May 18.—Left post with A. E. Burns, mounted, and 3 pack mules, and proceeded to Yancey's Hotel; saw 2 deer on the new Cooke City road, 4 near the halfway place, 4 in the Devils Gut, 4 antelope near the Blacktail Creek; also a great many elk scattered along the road to Yancey's—at least 400 of them. The beaver in the Blacktail Creek have not been molested this spring and they are doing a great deal of work all along the creek. In the vicinity of Yancey's place the beaver are increasing very rapidly; all the small creeks have beaver in them now; they are doing a great deal of work at present and have not been molested by anyone. Weather, cloudy and rainy; temperature, mild.

May 19.—Remained at Yancey's owing to the inclement weather; also to prospect the beaver dams in all the creeks around here; found them all in good condition and beaver doing a great deal of work on them; saw 25 elk near the hot spring, 2 miles southeast of Yancey's. Weather, cloudy; drizzling rain all day; temperature, mild.

May 20.—Left Yancey's and proceeded to Soda Butte; saw about 3,000 elk between Yancey's and Soda Butte, 37 antelope between Junction Butte and Little Specimen Creek, 17 deer near the Junction Butte. The beaver are doing a great deal of work in the streams around this district. Weather, cloudy and very stormy; temperature, cold.

May 21.—I remained at the station while Burns went up to Death Gulch and Cache Creek. Private Edwards went to Hellroaring Creek; Herb went with Burns. Privates Root, McDonald, and Palmer arrived to-day to relieve the present detachment. Herb and Burns report 11 dead bear in Death Gulch. Weather, cloudy; temperature, mild.

May 22.—Left station with A. E. Burns and went to J. S. Knowles' cabin on Crevasse Creek. Private Hardin and Private McDonald left station ahead of me to meet Private Edwards on Slough Creek; we met them all at that place. Slough Creek and Hellroaring Creek are up pretty high, but we had no difficulty in crossing them. On our way down the river I saw a man fishing along the bank, about 150 yards above the ford; did not say anything to him, but came down to the old cabin below Knowles' place, and there I found a man camped. I asked him what he was doing and he said himself and 2 other men were fishing. I went into the cabin and found about 20 pounds of fish hanging up in a secluded place. Everything looked rather suspicious to me; the man at the cabin said the other two were out fishing; but I saw 2 poles and 2 sacks at the cabin, and I concluded he was not telling the truth about the matter. I had come down the river myself and saw but one man, while the other ones were not there, as he had told me. They had been here three days—two of them—while the third one had come up last night. I told them they would have to stop fishing and return to Gardiner. They leave to-morrow morning. Saw about 2,500 elk between Soda Butte and Cotton Creek; 2 deer and 7 antelope on Slough Creek. Weather, cloudy; hard rain in the evening; temperature, mild.

May 23.—Left camp at J. S. Knowles', and proceeded to Fort Yellowstone. Before leaving camp, I went down to see if the 3 men who were fishing had left their cabin; found they had gone. When we went through Gardiner, I saw them there. Saw no game. Weather, cloudy and raining hard part of the day; temperature, cold.

May 24.—Remained in the post until 3 p. m., then took Private Kelner and 1 pack mule and went to J. S. Knowles' cabin on Crevasse Creek with order from the commanding officer and Acting Superintendent of the park to destroy all the cabins around Knowles' place. I burned 4 of them; 1 belonged to Tom Miner, 1 to Charles White, 1 to David Borem, and 1 to J. S. Knowles. I moved everything out before setting them on fire. Saw quite a number of grouse on Crevasse Mountain. John Ballinger is camped about one-half mile from the park line; saw where he had been in the park on foot on Crevasse Mountain. Weather, cloudy; temperature, cool.

May 25.—Left Knowles' to return to the post. Before leaving I looked at all the cabins that had been burned to see that there was no danger of fire spreading; found them all about out. The Yellowstone River is very high and muddy. Saw 1 deer, 1 mile north of the post. Weather, cloudy; temperature, cool.

May 26.—Left post and went to H. E. Klamers slaughterhouse and stayed there over night. Weather, cloudy; temperature, cold.

May 27.—Left slaughterhouse and rode up almost to the pocket on Fawn Creek.

The beaver have not done any work on this creek this spring. Three dams have been torn out, but it has been done a year or two ago. Saw about 300 elk on Fawn Creek and 27 on the Gardiner River. The beaver in Gardiner River are doing some work; but, owing to the high water, it is hard to tell how many there are in the district. Weather, clear; temperature, mild.

May 28.—Left post with Private Williams, of D Troop, and returned to the Gardiner River, then up Indian Creek to the foot of Bighorn Pass. The beaver are doing some work at present and have not been molested this spring, or up to the present time. There are about 500 elk near the headwaters of Indian Creek, 57 on Panther Creek, and 7 on Gardiner River. Left post at 7.45 a. m., returned at 3.30 p. m. Weather, cloudy; raining part of the day, and very cold.

May 29.—Remained in the post. Weather, cloudy; temperature, cool.

May 30.—Left post and went to Gardiner and Cinnabar. Returned to post this afternoon; went down to gather information. Weather, cloudy, stormy, and cold.

May 31.—Owing to no appropriation being made, I was laid off; this is the end of my scouting duty.

[James G. Morrison.]

March 26, 1898.—Remained at post. Weather, stormy; temperature, mild.

March 27.—Remained at post. Weather, clear; temperature, cold.

March 28.—Remained at post. Weather, clear; temperature, mild.

March 29.—Remained at post. Weather, clear; temperature, mild.

March 30.—Scout Whittaker and myself left post for Snake River Station. Stopped at Norris over night. Weather, cloudy; temperature, mild.

March 31.—Left Norris for Canyon. Weather, clear; temperature, mild.

April 1.—Went to the lake from Canyon, stopping at Mud Geyser for luncheon, and taking Privates Price and Canivan with us. Met Sergeant Leob, Privates Carter and Montgomery, from Snake River, at lake. Saw about 50 swan, 4 foxes, 2 coyotes. Weather, clear; temperature, mild. Distance, 17 miles.

April 2.—Scout Whittaker, Privates Canivan, Price, and Montgomery left Lake Hotel for Beaverdam cabin. Myself, Sergeant Leob, and Private Carter left Lake Hotel for Snake River Station; stopped over night at Thumb. Weather, clear in the forenoon, cloudy in the afternoon, and a little rain in evening; temperature, mild. Distance, 15 miles.

April 3.—Left Thumb for Snake River Station. Stopped at Lewis River cabin for lunch. Saw signs of 1 elk at Thumb and sign of a moose on Warm Spring Creek, about 2½ miles from Snake River Station. Weather, cloudy; temperature, mild. Distance, 27 miles.

April 4.—Stayed at Snake River Station. Weather, clear; temperature, mild.

April 5.—Privates Carter, Wharam, and myself left station. Went to Grassy Lake on road that leads to Falls River. Left the road there, turning southwest, coming out in Falls River Basin between Loon Lake and a lake about 2½ miles south of it, on a creek which has no name. Continued southwest about 3 miles and made a camp. Left Private Wharam in camp and went with Private Carter about 3 miles, coming out in a large flat, which extends northeast and southwest. On southwest end of flat we saw a shack which we went to and found a log house about 20 by 30 feet. Northwest of house is a log stable about 20 by 50 feet, alongside of which are two large haystacks. South of the house and stable about one-half mile are three stacks more. I believe these are all in the timber reserve about 1½ miles. There were no signs of anyone having been there or around there this winter. The streams in this country are all open, but saw no signs of beaver. Saw 2 mountain lion tracks. After finding cabins and hay Carter and myself returned to camp. Weather, clear; temperature, mild. Distance, 28 miles.

April 6.—Left camp, traveling northwest, striking Falls River near junction of Bechler River; thence up Falls River to Mountain Ash Creek, crossing the river, and up Mountain Ash Creek to cabin on same. Saw fresh signs of moose on Falls River near where we struck it; also fresh sign on Mountain Ash Creek, near cabin. Weather, clear in a. m., cloudy in p. m., snow in evening; temperature, mild. Distance, 22 miles.

April 7.—Left cabin on Mountain Ask Creek for Snake River Station; on arriving there found Scout Whittaker awaiting me with his detachment, having come from Upper Yellowstone. Saw signs of beaver in Proposition Creek. Weather, cloudy and snow; temperature, mild. Distance, 18 miles.

April 8.—Stayed at Snake River Station. Weather, stormy; temperature, mild.

April 9.—Sergeant Leob, Scout Whittaker, Privates Carter, Canivan, and Price, and myself left station, going over Pitchstone Plateau to Shoshone Geyser Basin. In going up Pole Cat Creek saw signs of 6 or 7 elk; sign of 1 in geyser basin. Weather, clear; temperature, mild. Distance, 30 miles.

April 10.—Same party left Shoshone Geyser Basin, going up Shoshone Creek about 3 miles; thence across to Firehole River, down it to Lone Star, there to road and to

Upper Basin. Saw signs of large game to-day. Weather, clear in forenoon, cloudy in afternoon; temperature, mild. Distance, 15 miles.

April 11.—Same party left Upper Basin, went to Fountain, walking about one-third of the way. Saw trail across road about 4 miles from Upper Basin of buffalo. I think there were 3 of them, but trail was about four days' old and in deep snow, and the number may not be accurate. Many signs of elk between Upper Basin and Fountain. Weather, clear; temperature, mild. Distance, 10 miles.

April 12.—Same party left Fountain for Norris. Saw signs of about 10 elk in Gibbon Canyon. Weather, clear; temperature, mild. Distance, 18 miles.

April 13.—Same party left Norris for Springs. Saw signs of beaver working on Willow Creek. Weather, clear; temperature, mild. Distance, 20 miles.

April 14.—Went to Cinnabar, Mont., to serve subpoenas on James Hawk and Frank Scott. Weather, clear; temperature, mild.

April 15.—Left post for station on Swan Lake Flat. Weather, clear; temperature, mild. Distance, 5 miles.

April 16.—Sergeant Welch, Private Holt, and myself left station, going west on Gardiner River, down it to mouth of Indian Creek, back to station along ridge east of river. The river is open in many places. Some signs of beaver working. Weather, clear; temperature, mild. Distance, 12 miles.

April 17.—Sergeant Welch, Private Holt, and myself left station, going west to Gardiner River, up it about 3 miles, then west across ridge to Fawn Creek, down it to mouth, back to station along ridge east of river. The river is open in many places and much sign of beaver work, one very large dam having been built this spring. Saw 29 elk near mouth of Fawn Creek. Weather, cloudy and snow; temperature, mild. Distance, 19 miles. Left station for post in evening.

April 18.—Remained at post. Weather, clear; temperature, mild.

May 3.—Scout Whittaker and myself left post, going out Cooke City road to Turkey Pen trail, down Blacktail Creek to Yellowstone River, crossing at ford, thence down river to Knowles place, stopping there over night. Examined beaver dams on Blacktail and found them undisturbed. Saw about 350 elk, 8 blacktail, 2 antelope on or near Blacktail. Weather, cloudy; temperature, cold; distance, 14 miles. We left Knowles, going up river to ford. Saw Mike O'Brien near ford fishing. He said he came from Gardiner this a. m. Crossed river, thence up Blacktail Creek to road, and thence to post. Saw about 200 elk, 2 antelope, 2 coyotes, 3 blacktail deer. Weather, cloudy; temperature, cold. Distance, 14 miles.

May 4.—Went part way to Gardiner and back to post on bicycle. Weather, cloudy; temperature, cold.

June 21.—Left post with Private Price for Gallatin; went up Fawn Creek through Fawn Pass; about 3 feet of snow in pass; camped on Gallatin River north of Crow-foot Ridge. Saw 12 elk near head of Fawn Creek; fresh signs of beaver on Fawn Creek opposite pocket. Distance, about 21 miles; weather, clear and warm.

June 22.—Left camp on Gallatin, going down it to where it turns north, then back northeast to head of Stellaria Creek, down to its mouth, and then down Fan Creek to mouth of it, camping on Gallatin River. Saw 1 cow elk on Stellaria Creek; no signs of beaver on any of the streams. Nobody has been in this country this spring. Weather, cloudy and warm. Distance, 14 miles.

June 23.—Leaving the camp on Gallatin, went down the river about 2 miles, when we struck fresh trail of three horses coming up and going back again. Followed trail about 2 miles down Gallatin; there it turned up a small creek coming in from the west; up it about one-half mile found a man in camp, Haskell by name, who had located a mining claim. He is camped about on or near park line (west). Had no horses; said his partner, Curtis, who lives on Gallatin about 3 miles outside of park, had gone to Bozeman for more provisions. Says he has been at his present camp since April 25. Showed us where the cabin was, and I think about one-half of it is in the park. Saw no sign of him doing any trapping or hunting; he had no gun, but plenty of picks and shovels. He is prospecting for George Alderson, of Bozeman. On the 15th he saw 2 men with 2 pack horses and 1 pack mule going up the Gallatin River. Says his partner, Curtis, told him it was "Scotty" and another man from Horr. I followed the trail he showed me up the Gallatin to near the mouth of Fan Creek; there it turned east. Will continue on trail up Fan Creek to-morrow. Saw 1 fish otter in Gallatin River near mouth of Baconrind Creek; while watching him he caught 2 fish. Distance, 17 miles. Weather, cloudy and rainy.

June 24.—Left camp on Gallatin, going up Fan Creek. Saw no signs of trail until I got up about 3 miles, then saw some trail had been made on Gallatin. It made for the pass between Fan Creek and Sportsmans Lake; followed it down Mulharen Creek to park line. Saw signs of fishing in lake. Saw no game to-day. Camped about on north line of park. Weather, cloudy and rainy. Distance, 15 miles.

June 25.—Left post with Privates Wigman and Canivan. Went to Yancey's. Saw no game. Weather, cloudy and rainy. Distance, 20 miles.

July 1.—Left Yancey's, going across bridge of Yellowstone. Camped on river. Saw 9 antelope. Weather, clear. Distance, 8 miles.

July 2.—Left camp on Yellowstone River, going up point of Specimen Ridge and along it to head of Deep Creek. Camped on head of Deep Creek. Saw 29 antelope and 1 elk. Weather, clear. Distance, 18 miles.

July 3.—The 3 pack mules took back trail to Yancey's, Wigman and myself following them, and got them at Yancey's. Stayed there over night, Canivan staying in camp. Saw about 50 antelope on Specimen Ridge. Weather, clear. Distance, 26 miles.

July 4.—Wigman and myself returned to camp on head of Deep Creek. Saw about the same antelope as on 3d. Weather, clear. Distance, 26 miles.

July 5.—Broke camp on Deep Creek, going over Mirror Plateau, crossing head of Opal Creek, then to Timothy, then over to head of Pelican Creek. Camped there. Saw no sign of buffalo. Saw about 5 cow elk with calf and 7 bulls. Distance, 17 miles. Weather, clear.

July 6.—Left the camp on head of Pelican Creek, went west to a small creek that flows into Broad Creek, down it to near its mouth, thence down Broad Creek about 2 miles, thence northeast to hot springs on Shallow Creek, up Shallow Creek to Wapiti Lake, thence east to camp. Saw signs of 3 buffalo (fresh), 2 on the small creek that flows into Broad Creek and one at Wapiti Lake. Saw 15 elk, all cows. Weather, clear. Distance, 15 miles.

July 7.—Left camp on head of Pelican Creek, went down it about 5 miles and made camp. In the afternoon went over to Fern Lake, around it to head of Sour Creek, down it, then followed fresh buffalo trail over ridge to Broad Creek, up it to Fern Lake and on to Tern Lake, from there to camp. Saw one buffalo; jumped 5 buffalo near ford of Broad Creek, following them to Fern Lake, where we saw the one, an old bull, on one of the heads of Sour Creek. Around Ponutpa Springs there were fresh signs of the band I saw there last winter. I think there are 30 buffalo in this country we came through. Saw about 100 elk. Weather, cloudy and rainy. Distance, 20 miles.

July 8.—Moved camp to Growler, on Plateau Creek. Leaving camp, went up East Fork of Pelican. Saw where 5 or 6 buffalo wintered near forks of Pelican Creek, but no fresh signs. Saw about 150 elk. Weather, clear. Distance, 14 miles.

July 9.—Broke camp and continued down Pelican Creek to the Yellowstone Lake; camped on lake shore about 1 mile from Lake Station. Saw about 100 elk on Pelican, mostly cows with calves, and 16 sand-hill cranes. Weather, clear. Distance, 16 miles.

July 10.—Left camp, going down the Yellowstone River to Canyon; camping there. Saw a black bear on north side of river. Weather, clear. Distance, 18 miles.

July 11.—Went to Norris. Weather, clear. Distance, 11 miles.

July 12.—Went to post. Weather, cloudy and rainy. Distance, 20 miles.

[Fountain Station, 1897.]

November 12.—Holman left station at 8 a. m., crossed the Firehole at footbridge west of the station, followed up Sentinel Creek to its source, and returned to station over same route. Saw tracks of deer and elk. Great many beaver in Sentinel Creek. Distance, 14 miles. Object, scouting.

November 13.—Burdett left station at 8.30 a. m. Followed the road to the Fountain Geyser, from there to Black Warrior, Great Fountain and Excelsior, from there traveled east following a small stream which flows from a basin about 3 miles from Excelsior Basin. Game, tracks of deer and elk.

November 15.—Holman left station at 8 a. m., crossed the Firehole River at wagon bridge which is southwest from the station, followed up Fairy Creek to the falls, and returned to station. Object, to ascertain if any buffalo had crossed going to Hayden Valley. Distance, 9 miles.

November 16.—Holman left station at 8.30 a. m., traveling north. Struck 1 mile west of Gibbon Falls. Followed wagon road to Norris and returned to station. Saw tracks of 1 mountain lion and 3 deer. Object, mail matter. Distance, 35 miles.

November 18.—Holman left station at 8 a. m.; followed trail to Summit Lake cabin, traveled along the west side of Bear Park, and returned to station. Distance, 30 miles.

November 19.—Holman and Burdett left station, 8 a. m., and followed trail to Bear Park; they returned to station, blazing the trail on return trip. Distance, 24 miles. Object, to blaze the trail.

November 23.—Halmon and Stitham left station at 8 a. m., following the road to Firehole Falls; there one man dismounted and followed down the river to its junction with the Gibbon, the other man followed the road, leading one horse. Saw no sign of beaver below the falls; some beaver signs between the falls and the troop camping grounds.

November 24.—Burdett left station 9 a. m.; followed Nez Perce Creek up to the mouth of Magpie; returned to the station over the same route. Distance, 14 miles.

November 27.—Holman left station at 9 a. m., mounted; traveled north and struck Gibbon River below the falls, following down the river on the north side to the junction and then followed the road to the station. Saw some bear signs 1 mile from the junction. Distance, 22 miles.

November 29.—Stitham left station 9 a. m., mounted, following the old road to Mary's Lake and returning to station by the same route. Distance, 20 miles.

November 30.—Burdett left station 9 a. m.; followed wagon road to Norris Station. Object, mail. Distance, 38 miles.

December 3.—Holman and Stitham left station at 7 a. m. on skis. Followed the trail to Summit Lake cabin; arrived there at 7 p. m. The following morning, after putting in wood enough to last one night, we left the cabin and traveled around Bear Park, keeping on the west side. From there we traveled northwest to Lower Bear Park; after scouting through it we returned to station. Saw no sign of buffalo; 15 elk near Twin Buttes, 3 deer near Fairy Falls. Distance traveled, 40 miles. Weather, clear.

December 6.—Mathieson and Stitham left station at 1 p. m. and followed road to Riverside. Stayed there over night and returned to station. Saw several beaver in Madison River; 175 elk in Madison Canyon. Distance, 34 miles. Weather, stormy.

December 10.—Holman and Mathieson left station on skis at 8 a. m. Followed up Nez Perce Creek to Magpie Creek and returned to station. Object, scouting. Distance, 14 miles. Weather, cloudy.

December 11.—Holman and Stitham left station, 8 a. m., on skis. Crossed the Firehole River on the footbridge west of the station; followed up Sentinel Creek to the head of the Queens Laundry and returned to station. Distance, 8 miles. Weather, snowing. Saw tracks of elk.

December 12.—Holman left station at 9 a. m., mounted. Followed the road to Excelsior Geyser. From there traveled southeast to a point 5 miles from Excelsior and returned to station. No sign of game. Distance, 20 miles. Weather, clear.

December 13.—Holman left station at 8 a. m. Traveled southeast to Juniper Creek and returned to station. No sign of game. Distance, 14 miles. Weather, cloudy.

December 14.—Burdett and Mathieson left station at 1 p. m. Traveled southwest to Fairy Falls and returned to station. Transportation, skis. Distance, 8 miles. Weather, clear.

December 17.—Mathieson and Stitham left station 8 a. m., followed old road half-way to Riverside and returned to station. No game. Distance, 17 miles. Weather, cloudy.

December 18.—Holman left station at 8 a. m., mounted. Traveled east to Canyon Creek and returned to station. Distance, 18 miles. No game. Weather, cloudy.

December 21.—Mathieson and Stitham left station, 9 a. m., on skis, followed Nez Perce Creek to foot of Mary's Mountain, and returned to station. Distance, 20 miles. No game. Weather, cloudy.

December 22.—Holman and Stitham left station, 9 a. m., crossed the Firehole River at the footbridge, followed up Sentinel Creek to its source, and returned to station. No game. Distance, 15 miles. Weather, clear.

December 24.—Burdett and Mathieson left station, 1 a. m. Traveled southeast and struck a deep canyon about 5 miles from the station, followed the canyon to the Black Warrior, and followed the wagon road to the station. Saw tracks of 15 elk. Distance, 15 miles. Weather, clear.

December 27.—Mathieson and Stitham left station, 7 a. m.; followed the blazed trail to Summit Lake cabin, stopped there one night, and returned to station. No game. Distance, 30 miles. Stormy scouting.

December 29.—Holman, Mathieson, and Stitham worked at the ice house.

December 30.—Burdett and Stitham left station, 12 m.; followed the Firehole to the falls, and returned to station. Saw some bear tracks across the road. Distance, 10 miles. Weather, clear.

[1898.]

Holman and 4 men worked at ice house from January 3 to January 6, putting up about 20 tons of ice.

January 6.—Holman, Burdett, P., and Burdett, C., left station, 8.15 a. m. Followed the old road to Riverside. Stopped there one night. Holman and Burdett, P., returned to station. Object of trip to accompany Burdett, C., to his station. Distance, 34 miles. Weather, snowing. Saw tracks of 75 elk in Madison Canyon.

January 8.—Mathieson and Stitham left 9 a. m., following down the Firehole to the falls, and returned to station. Saw 25 geese and 40 ducks. Weather, stormy.

January 10.—Holman and 3 men worked at ice house.

January 12.—Burdett, Mathieson, and Stitham left station at 9 a. m., crossed the

Firehole River at the first bridge, followed up Sentinel Creek to the beaver dams, and returned to station. Saw 12 geese, 25 ducks, and 1 swan. Distance, 10 miles.

January 13.—Holman, Burdett, and Mathieson left station 8.30 a. m.; followed Nez Perce Creek to the foot of Mary's Mountain, and returned to station. Saw 1 beaver, 3 elk, and 19 ducks. Tracks of 50 elk. Distance, 20 miles. Weather, snowy.

January 14.—Holman and Stitham left station at 11 a. m.; followed the road to Canyon Creek, and returned to station. Saw 12 ducks. Lieutenant Lindsley and Scout Morrison arrived from Riverside.

January 15.—Mathieson left the station at 8 a. m. and followed the telegraph line to Canyon Creek, where he met Private Holt, who was ordered here from Norris, and returned to station. Distance, 18 miles. Weather, clear.

January 16.—Lieutenant Lindsley and detachment left for Snake River via Upper Basin and Thumb, taking 2 men, mounted, from here, as far as the Upper Basin, with rations.

January 17.—Burdett and Mathieson returned from Upper Basin. Saw 50 ducks on Firehole River. Weather, cloudy.

January 18.—Mathieson and Syberty left at 8 a. m. on skis; traveled northeast, and struck Magpie Creek about 4 miles from its mouth; followed this stream to its junction with the Nez Perce, thence west along the Nez Perce to the station. Saw 3 elk. Weather, clear; distance, 18 miles.

January 19.—Holman and Burdett left station 9 a. m. on skis; followed the road to Norris Station, remained there one day, and returned to station on the 21st. Object, mail.

January 24.—Holman, Burdett, and Mathieson left station at 7 a. m. and followed the road to the Upper Basin; stayed there one night, and left the next day at 7 a. m.; scouted through the Black Sand and Biscuit basins, and returned to station. Weather, clear; distance traveled, about 30 miles.

January 28.—Holman, Burdett, and Syberty left station 1 p. m.; crossed the Firehole River at the footbridge and followed Sentinel Creek to the Queen's Laundry, thence south to Twin Buttes, thence east to the river, and followed the river to the station. Distance, 10 miles. One hundred ducks in the river. Weather, clear.

January 31.—Holman, Burdett, and Mathieson left station at 8 a. m.; followed up Nez Perce Creek to the mouth of Juniper Creek, and then followed up Juniper to the hot springs, thence east to Spruce Creek and down Spruce to its junction with the Nez Perce, thence west along the Nez Perce to the station. Saw tracks of 10 elk and some beaver signs in Spruce Creek; also saw a great number of geese, ducks and fishes in and along the streams. Distance traveled, about 20 miles. Weather, fine.

February 2.—Burdett and Syberty left station at 8 a. m.; followed the road to Canyon Creek, and returned to station. Object, breaking trail.

February 3.—Burdett and Syberty left station at 7 a. m. on skis; followed the old road to the foot of Mary's Mountain, and returned to station. Object, to meet Holt and Stitham, who were coming in from Mud Geyser. Weather, snowy.

February 6.—Holman, Burdett, and Syberty left station at 9 a. m. mounted; followed the road to Madison Canyon, and returned. Saw tracks of 100 elk. Distance, 16 miles. Weather, stormy.

February 7.—Stitham and Syberty left station at 8 a. m.; followed road to Canyon Creek, and returned to station. Object, breaking trail. Cloudy.

February 8.—Holman, Burdett, and Syberty left station at 8 a. m.; followed up Nez Perce Creek to the mouth of Magpie Creek, thence north along Magpie to a point 5 miles from its mouth, and returned to station over the same route. Saw tracks of 5 elk. Distance, 20 miles. Object, scouting.

February 9.—Holman, Burdett, and Syberty left station at 9 a. m., following the old road to Mary's Lake. After scouting along the foot of the mountain two hours, we returned to the station. Saw 20 elk. Distance, 24 miles. Cloudy.

February 10.—Holman, Burdett, and Syberty left station at 7 a. m. on skis; followed up Nez Perce Creek to the mouth of Spruce Creek, thence up Spruce Creek to the hot springs, and returned to station. Saw tracks of 10 elk. Distance, 24 miles. Weather, fine.

February 14.—Holman, Burdett, and Stitham left station at 7 a. m.; followed the trail to Summit Lake cabin, arrived there at 5 p. m. Saw 1 swan and tracks of 5 elk between the station and Twin Buttes. Distance, 15 miles. Weather, stormy.

February 15.—Left Summit Lake cabin at 9 a. m.; traveled south to Summit Lake, thence west to hot springs and then back to the lake, thence south to hot springs, 1 mile south of the lake, and then followed the trail back to the cabin. Saw tracks of 1 mountain lion. Distance, 10 miles. Weather, stormy.

February 16.—Left the cabin at 9 a. m., went northwest to Lower Bear Park, from here followed the trail to the station. Saw tracks of 10 elk near Twin Buttes. Distance, 15 miles. Weather, snowy. Object, scouting.

February 22.—Holman, Burdette, and Syberty left station at 9 a. m. with five day's

rations; followed the road to the Upper Basin; stayed there until the following morning; left there at 8 o'clock; followed the road to the Lone Star Geyser; there we took off our skis and waded the Firehole River and followed it to a point about 3 miles north of Madison Lake. Here we left the river and traveled southeast and struck Shoshone Creek 2 or 3 miles from the Shoshone Geyser Basin, where we made camp. Left Shoshone Creek the following morning; followed down the creek to the lake, and followed around on the side of the lake. Made camp on Heron Creek; left Heron Creek the next morning at daylight and struck the main road near the 9-mile post; followed it to the Upper Basin station and stayed there for the night. Left the Upper Basin the next morning and followed the road to the station. Saw 10 elk near Twin Buttes, tracks of 2 elk near the station. Saw no sign of game in Shoshone Basin. Distance traveled, about 67 miles. Weather, cloudy and snowing.

March 2.—Burdett, Mathieson, and Syberty left station at 9 a. m.; followed up the Firehole River to the Biscuit Basin and returned to station via Great Fountain Geyser. Saw tracks of 15 elk. Weather, clear.

March 3.—Holman left station mounted, and followed up Nez Perce Creek to the foot of Mary's Mountain and returned to station. Saw tracks of 25 elk near the mountain. Saw 25 elk 2 miles from the station.

March 4.—Burdett, Mathieson, and Syberty left station at 8 a. m. and followed the road to the junction of the Firehole and Gibbon rivers; from there, followed up the Gibbon to a point about 5 miles from the falls and returned to station over the same route. Saw 200 elk near the junction of the rivers, and saw tracks of a great many elk. Distance, 24 miles.

March 10.—Holman, Burdett, and Mathieson left station at 8 a. m.; followed the road to Norris, remained there one day, and left Norris on the morning of the 12th; followed the wagon road to the post; remained at the post two days to draw clothing. Holman and Burdett left the post on the morning of the 15th; followed the road to Crystal Springs, stopped there one night; on the following day followed the road to Norris; left Norris next morning and followed the road to the station. Distance traveled, 78 miles. Object, to accompany Mathieson to the post on account of expiration of his term of service.

March 19.—Holman and Syberty left station on skis; followed the road to the Upper Basin, stopped there overnight, and returned to station via Biscuit Basin. No game. Weather, snowing.

March 23.—Left station with one man, crossed the river on the foot bridge, followed up Sentinel Creek to the head of the Queen's Laundry, and returned to station.

March 26.—Holman and Syberty left station at 7 a. m.; followed the road to the junction of the Firehole and Gibbon rivers; from there followed up on the north side of Gibbon River to near the falls; crossed the river and followed the road to the 9-mile post from the hotel; left the road there, traveled south and struck the telegraph line and followed it to the station. Saw 15 elk along the Gibbon River. Saw tracks of 250 elk. Distance traveled, 22 miles. Weather, snowing.

March 29.—Holman, Stitham, and Syberty left at 6.30 a. m.; followed up Nez Perce Creek to the foot of Mary's Mountain; from there followed up a small stream that flows southward along the mountain to a point about 3 miles from its mouth; thence west to Magpie Creek, and then down Magpie to the road and followed the road to the station. Saw 1 elk and tracks of 15. Some fresh beaver signs in a small stream near the mountain. Distance traveled, 20 miles. Weather, fine. Object, scouting.

March 30.—Holman, Stitham, and Syberty left station at 7 a. m.; traveled southeast and came to a deep canyon about 4 miles from the station; followed down the canyon to the Black Warrior; from there traveled around the Great Fountain and near to the Excelsior, and followed the road to the station. Saw tracks of 3 elk near the station. Saw a stray horse at the Black Warrior. Distance, 12 miles. Weather, snowy.

April 2.—Stitham and Syberty left station 6 a. m.; followed the road to Norris station; there one night and returned to station. Object, mail.

April 5.—Holman, Stitham, and Syberty left station at 6.15 a. m.; followed up Nez Perce Creek to Spruce Creek, thence up Spruce to the hot springs, thence north along the mountain to the old road, thence west to the station. Saw tracks of 25 elk; saw 2 coyotes and 1 red fox. Distance, 21 miles. Weather, fine.

April 8.—Holman, Stitham, and Syberty left station at 7 a. m. on skis; traveled southwest to Twin Buttes, thence northwest to the head of the Queen's Laundry, thence east to the station. Saw 7 elk near Twin Buttes; 5 coyotes; tracks of 10 elk. Distance, 10 miles. Weather, fine.

April 12.—Stitham and Syberty left station at 4.30 a. m.; followed up the road and struck buffalo trail 4 miles north of Upper Basin; followed trail up for 4 or 5 miles; lost the trail there, and then traveled south to the Upper Basin; stopped there for the night and returned to station the next day. Distance traveled, 30 miles.

April 14.—Holman and Syberty left station at 6 a. m., on skis; followed the road

to Madison Canyon; from there followed up the Gibbon River for about 5 miles, then returned to station. Saw 40 elk and tracks of 200, 2 minks and 3 muskrats in the Firehole, 2 coyotes, and 1 red fox. Distance traveled, 24 miles. Weather, fine. From all indications the elk are leaving Madison Canyon and coming into the Lower Basin.

April 15.—Stitham and Syberty left station on skis at 5.30 a. m.; followed the road to Canyon Creek and returned to station. Saw tracks of 1 bear. Weather, fine. Distance, 18 miles. Object, mail.

April 16.—Holman left station at 8 a. m., mounted; followed Nez Perce Creek to the mountain and then traveled south along Mary's Mountain; struck Spruce Creek about 5 miles from its mouth and followed it to the Nez Perce, then followed it to the station. Saw tracks of 75 elk. Saw 1 red fox and 2 coyotes. Weather, fine. Distance traveled, 22 miles. Object, scouting. A great many fresh beaver signs along the Nez Perce.

April 17.—Stitham and Syberty left station, mounted, at 1 p. m.; followed the road to Madison Canyon; there they met Sergeant Bernstein and 2 men from Riverside. They stopped there one hour and returned to station. Saw tracks of 20 elk. Distance traveled, 16 miles. Weather, snowing. Object, to take some packages for Sergeant Bernstein which had been left here.

April 18.—Holman and Syberty left station at 8 a. m.; followed the road to first bridge south of the Excelsior; there we left the road and patrolled through the Biscuit Basin. Arrived at the Upper Basin at 12 m.; stopped there one hour for lunch, and then followed the road down to the 5-mile post; left the road and followed up a small stream which flows from a hot basin. Patrolled all through the basin and returned to station. Saw tracks of 15 elk. Saw 2 coyotes. Distance traveled, about 35 miles. Weather, fine.

April 19.—Stitham and Ornes left station at 12 m. and followed the road to Riverside. Stitham stopped there one night and returned to station. Object of trip, to take Ornes to Riverside. He came out here on skis and was ordered to go to Riverside; as the snow is nearly all gone, he couldn't go on skis, and I sent him down mounted.

April 21.—Stitham and Syberty left station, mounted, at 10 a. m.; followed the road to Norris, and arrived there at 3 p. m. Returned to station the following morning. Saw tracks of 23 elk. Saw 1 bear and 3 cubs. Distance traveled, 38 miles. Weather, snowing. Object, mail.

April 23.—Holman left station at 9 a. m.; followed Sentinel Creek to the beaver dams and returned to station. Saw tracks of about 30 elk. Distance traveled, 8 miles. Weather, clear. Object, to look after the beaver.

April 24.—Holman left station at 8 a. m., mounted; followed the road to Riverside Station; there three hours and returned to station. Saw 2 coyotes, 3 muskrats, 1 mink, 1 badger, 2 grouse, tracks of 8 elk, and some fresh beaver signs along the Firehole. Met Scout Whittaker on the road to Riverside with pack train. Object, a trip to take some mail to Riverside and to get some fresh meat. Distance, 34 miles. Weather, fine.

April 25.—Holman left station, dismounted, at 8 a. m.; followed up Nez Perce Creek to Magpie; waded all through the beaver dams and returned to station. Saw 1 coyote, tracks of 30 elk, 3 sand-hill cranes. Distance, 10 miles. Weather, fine.

April 26.—Holman left station at 7 a. m., dismounted; traveled southwest to Twin Buttes and returned to station. Saw 39 elk, 2 coyotes, 4 sand-hill cranes, and 1 mink. Distance traveled, 10 miles. Weather, clear and high winds. Object of the trip, to try the skis between Twin Buttes and Summit Lake Cabin.

April 27.—Burdett and Stitham left station at 10 a. m. to go to the post, in compliance with verbal orders from the commanding officer.

April 28.—Syberty left station at 7 a. m., mounted, following the road to the post; remained there one day and returned to Norris on the 30th. Left Norris on the 1st of May and came back to station by the road. Distance traveled, 78 miles. Object, to get the horses shod.

May 3.—Holman left station, mounted; followed the old road half way to Riverside and returned to station. Saw 1 mink, 1 coyote, and tracks of 15 elk. Distance traveled, 16 miles. Weather, cloudy. Object, scouting.

May 4.—Holman left station at 9 a. m.; followed the road to the Upper Basin, mounted, and returned to station. Saw 81 elk and 1 coyote, and 4 sand-hill cranes. Distance traveled, 20 miles. Weather, cloudy. Object, scouting.

May 5.—Holman left station at 9 a. m., mounted; followed up Nez Perce Creek to the foot of Mary's Mountain and returned to station. Saw 1 coyote, 1 mink, 2 sand-hill cranes, and tracks of 75 elk. Distance traveled, 16 miles. Weather, snowing. Object, scouting.

May 6.—Holman left station at 9 a. m., crossed the Firehole River on footbridge west of the station, struck Sentinel Creek near its mouth, followed it to the head of the Queen's Laundry, and returned to station. Saw 1 bear, 1 mink, tracks of 15 elk.

Distance, 8 miles. Weather, clear. Object, scouting. Transportation, dismounted (on foot).

May 7.—Holman left station at 7.30 a. m., dismounted, to look for the horses which have strayed away. Struck their trail on the road leading to Norris; followed the trail up to Gibbon Canyon; there I met the lineman. He said he saw 2 horses in Elk Park; followed the road to Elk Park, looked all down the park, but did not find them; followed the road to Norris. Moore went out mounted, and found them near the station. I remained there until 3 p. m. and returned to the station. Distance traveled, about 45 miles. Weather, cloudy. Saw 1 mink in the Gibbon, tracks of 1 bear, and about 7 elk.

May 8.—Syberty left station, mounted, at 8 a. m.; followed the road to Norris and returned to station on the 9th. Distance traveled, 38 miles. Weather, clear. Object, mail.

May 10.—Holman left station at 7 a. m., followed the road to the post, remained there two days, left the post on the 14th, followed the road to Norris, stayed there one night, and came to the station on the 15th. Distance traveled, 78 miles.

May 18.—Holman left station at 9.30 a. m., mounted, for Riverside Station; arrived there at 1 p. m. Saw 15 elk, 7 badgers, 1 coyote, 2 grouse, and tracks of 1 bear. Weather, raining. Left on the morning of the 19th, followed the road to the station; saw numerous geese and 1 pheasant. Distance traveled, 32 miles. Syberty left station at 10 a. m., mounted; followed up the road to the Biscuit Basin, patrolled through the basin and returned to station. Saw 4 blacktail deer, 2 bear, 1 silver fox, and numerous geese. Distance traveled, 15 miles. Weather, snowing and blowing.

May 20.—Syberty patrolled road to Madison Canyon and return. Saw 18 antelope near Gibbon Bridge; tracks of 11 elk. Distance traveled, 16 miles. Weather, cloudy and snowing. Holman left station, mounted, at 10 a. m.; followed up Nez Perce Creek to the mouth of Magpie Creek, waded all through the beaver dams, found everything O. K., and returned to station. Saw 1 coyote, 2 minks, 2 grouse, and numerous geese. Distance traveled, 10 miles.

May 23.—Holman left station, mounted, at 10 a. m.; crossed the Firehole River at ford, followed up Sentinel Creek to the head of the Queen's Laundry, examined the beaver dams closely, and returned to station. Saw 75 elk, 1 coyote, numerous geese and ducks. Distance traveled, 8 miles. Weather, rainy. Object, scouting.

May 24.—Holman and Syberty left station at 7.30 a. m., mounted, following up the road to the Lone Star Geyser. Then we dismounted and tied our horses up and followed up the Firehole River to a point about 3 miles south of the Lone Star. Looked closely for beaver signs, but found no fresh ones. Returned to station at 5.30 p. m. Saw 1 bear, 1 coyote, tracks of 30 or 40 elk. Distance traveled, 34 miles. Weather, rainy. Object, scouting.

May 25.—Holman left station, mounted, at 1 p. m.; followed up Nez Perce Creek to the mouth of Magpie and returned to station. Saw tracks of 19 elk and of 1 bear. Distance traveled, 10 miles. Weather, cloudy. Object, scouting.

May 26.—Syberty left station at 8 a. m.; followed the road to Riverside, remained there one night and returned to the station the following day. Saw numerous geese. Distance, 32 miles. Weather, cloudy.

May 29.—Holman left, mounted, at 1 p. m.; traveled southeast to Twin Buttes and returned to station. Saw 27 elk, 1 coyote, 2 grouse, tracks of 1 bear. Weather, cloudy.

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REPORT

OF THE

CLERK IN CHARGE OF PUBLIC DOCUMENTS.

DEPARTMENT OF THE INTERIOR,
Washington, December 1, 1898.

SIR: I have the honor to submit herewith for transmission to Congress, in compliance with the provisions of an act approved January 12, 1895, a report of the number of documents received, distributed, and sold by this Department during the year 1897-98.

Very respectfully,

JOHN G. AMES,
Clerk in Charge of Documents.

The SECRETARY OF THE INTERIOR.

*PUBLICATIONS OF THE GOVERNMENT RECEIVED, DISTRIBUTED, AND
SOLD BY THE SEVERAL OFFICES AND BUREAUS OF THE DEPARTMENT OF THE INTERIOR, 1897-98.*

OFFICE OF THE SECRETARY.

Publication.	Received.	Distributed.
Reports of the Secretary of the Interior and accompanying documents, bound...	5, 130	11, 328
Reports of the Secretary of the Interior and of subordinate officers of the Department, pamphlet.....	38, 350	35, 073
Land Decisions and Digest.....	1, 846	590
Pension Decisions and Digest.....	1, 466	1, 208
Official Register of the United States, 1897, Volumes 1 and 2.....	400	219
Map of United States.....	100	1, 353
Maps of States and Territories.....	200	102
Records of the War of the Rebellion.....	480	442
Statutes at Large.....	55	8
Revised Statutes, United States.....	5	5
Supplement to Revised Statutes, Volume 1.....	5	6
Supplement to Revised Statutes, Volume 2, Parts 6 and 7.....	250	282
Session Laws.....	250	230
Congressional Directory.....	1, 440	1, 552
Register of the Department of the Interior.....	2, 482	2, 034
Resources of Alaska.....	100	4
Handbook of Alaska.....	100	70
Gold Fields of Alaska, Becker.....	500	115
Geology of the Yukon District, Alaska, Spurr.....	565	123
Mineral Resources of the United States.....	138	594
Annual Reports of the United States Geological Survey.....	80	45
Bulletins of the United States Geological Survey.....	22, 528	22, 528
Monographs of the United States Geological Survey.....	3, 898	3, 898
Atlases accompanying Monographs.....	926	926
Geological Folios.....	8, 682	1, 682
Messages and Papers of the Presidents.....	45	62
Lands of the Arid Regions.....		70
Land Laws, United States.....		6

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OFFICE OF THE SECRETARY—Continued.

Publication.	Received.	Distrib- uted.
History of the Public Domain		1
Comprehensive Index of Government Publications		26
Descriptive Catalogue of Government Publications		1
Methods of Business in the Interior Department		3
Reports of Survey of Territories, Hayden		61
Treaties and Conventions between the United States and other Powers		11
Revision of Indian Treaties		2
Proceedings of the National Museum		7
Bulletins of the National Museum		80
Tertiary Vertebrata		56
Tertiary Insects of North America		58
Cretaceous and Tertiary Flora		51
Tertiary Flora		2
Pinnipeds of North America		2
Revised Statutes of District of Columbia		2
Geology of Uinta Mountains, and Atlas		2
High Plateaus of Utah, and Atlas		2
Entomological Reports		3
Catalogue of Departmental Library		2
Reports of the Tenth Census		2, 103
Reports of the Eleventh Census:		
The Compendium, Part 1		3, 928
The Compendium, Part 2		3, 928
The Compendium, Part 3	49, 412	37, 809
The Abstract, first edition		10, 888
The Abstract, second edition		8, 258
Monographs—		
Vital Statistics of the District of Columbia and Baltimore		179
Education in the United States		171
Electrical Industries in the State of New York		176
Textile Industries of the United States		180
Transportation on the Pacific Coast		189
Vital Statistics of New York and Brooklyn		154
Agriculture by Irrigation in the Western Part of the United States		1, 380
Vital Statistics of Boston and Philadelphia		160
Social Statistics of Cities		109
Occupations of the Population		188
Final volumes—		
Mineral Industries		693
Wealth, Debt, and Taxation, Part 1, Public Debt		678
Wealth, Debt, and Taxation, Part 2, Valuation and Taxation		1, 058
Population and Resources of Alaska	540	805
Indians Taxed and not Taxed		749
Statistics of Churches		814
Population, Part 1		4, 781
Population, Part 2	29, 606	14, 484
Insurance, Part 1, Fire, Marine, and Inland		725
Insurance, Part 2, Life		855
Transportation, Part 1, Land		992
Transportation, Part 2, Water		774
Manufactures, Part 1, States, etc		963
Manufactures, Part 2, Cities		957
Manufactures, Part 3, Selected Industries		826
Vital Statistics, Part 1, Analysis and Rate Tables	10, 000	8, 062
Vital Statistics, Part 2, Cities of 100,000 and Upward		1, 128
Vital Statistics, Part 3, Statistics of Deaths		908
Vital Statistics, Part 4, Statistics of Deaths		1, 123
Crime, Pauperism, and Benevolence, Part 1		1, 062
Crime, Pauperism, and Benevolence, Part 2		862
Insane, Feeble-Minded, Deaf and Dumb, and Blind		1, 058
Agriculture, Irrigation, and Fisheries		2, 606
Agriculture and Fisheries		1, 544
Real Estate Mortgages		960
Farms and Homes: Proprietorship and Indebtedness		1, 135
Miscellaneous publications from libraries, etc	727	
Miscellaneous publications to Superintendent of Documents		3, 081

The whole number of census reports received to the close of the fiscal year is 644,254. Since that date a portion of the edition of the Statistical Atlas of the United States, ordered by Congress, has been delivered by the Government Printing Office. This is the last of the publications of the Eleventh Census, the entire edition of which it is hoped will be received by the close of the present calendar year. The first volume published, viz, the Report on Mineral Industries, was received from the Printing Office during October, 1892.

PATENT OFFICE.

Publication.	Received.	Distributed.
Official Gazette, weekly edition, pamphlet.....	338,000	309,345
Official Gazette, quarterly edition, bound.....	2,000	33
Indexes:		
Annual.....	7,000	6,183
Quarterly.....	28,000	24,300
Index to Italian Patents.....		1
Decisions of the Commissioner and United States Courts.....	1,500	227
Specifications and Drawings of Patents, monthly volumes.....	2,280	718
Rules of Practice.....	35,000	29,300
Patent Laws.....	11,000	8,600
Roster of Registered Attorneys.....	7,200	4,675
Reports of the Commissioner.....	2,000	1,750
Trade-Mark Laws and Rules.....	1,000	900

LAND OFFICE.

Maps of the United States.....		400
Maps of States and Territories.....		2,000
Report of the Commissioner, Annual.....	3,000	3,100
Circulars.....	90,000	80,000

OFFICE OF INDIAN AFFAIRS.

Report of the Commissioner, Annual, bound.....	1,000	500
Report of the Commissioner, Annual, pamphlet.....	2,000	750
Contract Tables.....	1,100	1,050
Report of Superintendent of Indian Schools.....	1,000	925
Regulations of the Indian Office.....		86
Routes to Agencies.....	1,000	150
Proceedings of Institutes.....	1,000	1,000
Opinions of the Attorney-General on Osage Contest Cases.....	150	44

PENSION OFFICE.

Report of the Commissioner, Annual, pamphlet.....	1,853	1,853
Laws of the United States Governing Granting of Army and Navy Pensions.....	6,000	5,006
Digest of Pension Laws.....	285	248
Roster of Examining Surgeons.....		20
Roster of Disqualified Attorneys.....	1,000	652
Treatise of Practice of Bureau.....	2,006	1,944
Instructions to Examining Surgeons.....	10,000	7,700
Instructions to Special Examiners.....	1,000	628

OFFICE OF COMMISSIONER OF RAILROADS.

Report of the Commissioner.....	2,000	1,575
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BUREAU OF EDUCATION.

Annual Report for—		
1893-94, volume 1.....	20,000	20,000
1893-94, volume 2.....	20,000	19,888
1894-95, volume 1.....	20,000	19,936
1894-95, volume 2.....	20,000	19,605
1895-96, volume 1.....	20,000	19,866
1895-96, volume 2.....	20,000	19,781
Annual Reports for prior years.....	178	1,871
Annual Reports, unbound.....	143	246
Annual Statement of the Commissioner for—		
1891.....		896
1892.....		232
1894.....		201
1895.....		88
1896.....		334
1897.....	2,000	1,941
Introduction of Reindeer in Alaska, 1897.....	1,000	1,000
Education in Alaska, 1895-96.....	1,000	1,000
Money appropriated for Education in Alaska.....	1,000	860

BUREAU OF EDUCATION—Continued.

Publication.	Received.	Distrib- uted.
History of Higher Education in—		
Florida		307
Wisconsin		277
Michigan		191
Ohio		282
Connecticut		283
Iowa		325
Rhode Island		316
Maryland		311
History of Education in Georgia		148
College of William and Mary		242
Education in Southwestern Virginia		154
Schools in British India	53	10
Organization and Management of Public Libraries		155
Instruction in Morals and Civil Government		783
Education in Italy and Greece		173
Statistics regarding National Aid to Education		664
International Education Congress at Havre		4
Contributions to the History of Medical Education and Medical Institutions in United States 1776-1876		51
Outlines for a Museum of Anatomy		43
Indian Education		22
Honorary Degrees Conferred in American Colleges		68
Fourth International Prison Congress, in Russia		146
Rise and Growth of Normal School Idea		285
Biological Teaching in Colleges in United States		220
Analytical Index to Barnard's Journal of Education	369	50
Report on Legal Education	109	89
Shorthand Instruction and Practice		402
Abnormal Man		64
The Spelling Reform		261
Cutter's Rules for Dictionary Catalogue		638
Educational Congress, Columbian Exposition		247
World's Library Congress, 1893		493
Notes on Education at World's Columbian Exposition		180
Public, Society, and School Libraries in United States	1,000	1,430
Our Schools and Forests		43
What is Education		49
Report of the Department of Superintendence N. E. A., 1874		26
Educational Needs of the South		66
National Aid to Education		33
Needs of the Bureau of Education		27
Museums Illustrative of Education	50	20
World's Columbian Exposition—		
Circular No. 2		78
Circular No. 4		5
United States Bureau of Education, 1867-1888		182
Technical Education and Industrial Drawing		55
Reports on Schools of Science		25
Educational Exhibit at International Centennial Exposition, 1876		10
Schedule for Preparation of Students' Work for the Centennial, 1876		16
Elementary Education in London		88
Proceedings Department Superintendence of N. E. A., 1880	452	20
Instruction in Chemistry and Physics in United States		50
Construction of Library Buildings		125
Coducation of the Sexes in Public Schools in United States		658
City School Systems in the United States		49
Review of Reports of British Royal Commissioners of Technical Education, with notes		189
Report on School Architecture and Plans for Graded Schools		58
National Bureau of Education: Its History, Work, and Limitations		47
International Conference on Education in Philadelphia, 1876		40
Indian School at Carlisle		190
Vacation Colonies for Sickly School Children		405
Progress of Western Education in China and Siam		31
Educational Tours in France		634
Bulletin on Fifty Years of Freedom in Belgium: Education in Malta; Third International Geographical Congress at Venice, 1881; Illiteracy and Crime in France; School Savings Banks: Education in Sheffield		376
Suggestions Respecting Educational Exposition at New Orleans, 1884-85	164	30
Document Illustrative of American Educational History	1,150	198
Digest of Public School Laws	1,150	219
Education and Patho-social Studies	1,000	380
Classification in Graded Schools	1,000	142
Report on Sunday Schools	1,040	17
Art and Industry:		
Part 2	447	20
Part 3	2,250	1,061
A. L. A. Catalogue (1896-97)	10,000	5,092
Special Reports (pamphlet)	117	28

UNITED STATES GEOLOGICAL SURVEY.

Publication.	Received.	Distrib- uted.
Eighteenth Annual Report:		
Part 1.....	3,700	102
Part 4.....	3,700	398
Part 5.....	4,000	1,050
Part 5—continued.....	3,850	1,023
Director's Report from Eighteenth Annual.....	1,000	617
Appendix to Director's Report from Eighteenth Annual.....	300	130
Monograph XXVIII (atlas).....	1,306	1,306
Bulletin 87.....	3,000	2,554
Bulletin 88.....	3,000	2,435
Water-Supply and Irrigation Papers:		
No. 2.....	1,000	978
No. 3.....	1,000	1,000
No. 4.....	1,000	931
No. 5.....	1,000	928
No. 6.....	1,000	856
No. 7.....	1,000	912
No. 8.....	1,000	965
No. 9.....	1,000	859
No. 10.....	1,000	836
No. 11.....	1,000	893
No. 12.....	1,000	866
No. 13.....	1,000	829
No. 14.....	1,000	828
No. 15.....	1,000	834
No. 16.....	1,000	833
Separates:		
Iron Ores, 1896.....	1,500	1,500
Gold and Silver, 1896.....	1,000	817
Witwatersrand Banket.....	400	303
Copper, 1896.....	100	100
Lead and Zinc, 1896.....	200	180
Aluminum, 1896.....	100	81
Quicksilver, 1896.....	100	81
Manganese, 1896.....	400	365
Nickel and Cobalt, 1896.....	100	100
Antimony, 1896.....	100	91
Platinum, 1896.....	100	87
Coal, 1896.....	3,000	3,000
Coke, 1896.....	500	478
Petroleum, 1896.....	500	460
Natural Gas, 1896.....	1,600	1,532
Asphaltum, 1896.....	100	100
Stone, 1896.....	6,050	5,822
Soapstone, 1896.....	100	79
Statistics of Clay-Working Industries, 1896.....	3,250	2,958
Cement, 1896.....	200	200
Precious Stones, 1896.....	700	644
Abrasive Materials, 1896.....	300	256
Phosphate Rock, 1896.....	300	272
Sulphur and Pyrites, 1896.....	100	100
Gypsum, 1896.....	700	555
Salt, 1896.....	300	283
Fluorspar, Cryolite, and Mica, 1896.....	100	93
Asbestos and Graphite, 1896.....	100	88
Mineral Paint and Barites, 1896.....	250	250
Fullers Earth, 1896.....	100	96
Lithographic Stone, 1896.....	100	66
Feldspar and Quartz, 1896.....	150	137
Mineral Waters, 1896.....	600	457
Reconnaissance of the Gold Fields of Southern Alaska.....	1,500	1,229
Geology of Yukon Gold District.....	1,500	1,306
Progress of Stream Measurement.....	300	109
Well Waters of Ohio and Indiana.....	300	268
New Developments in Well Boring and Irrigation in Eastern South Dakota.....	300	223
Reservoirs for Irrigation.....	300	281
Geologic Atlas Folios.....	37,276	18,961
Map of Alaska.....	42,000	39,748
Topographic Maps.....	392,563	65,909
Publications received prior to July 1, 1897:		
Documents.....		83,898
Geologic Atlas Folios.....		2,064
Topographic Maps.....		86,041

SUPREME COURT REPORTS.

Three hundred and seventy-six copies each of volumes 167 to 169 of United States Reports were delivered to the Department by the reporter of the Supreme Court, in compliance with the provisions of section 681 of the Revised Statutes and of act of February 12, 1895, which have been distributed to judicial and other officers of the Government entitled to receive them.

Attention is once more called to the importance of additional provision for the purchase and distribution of these volumes. Since the passage of the act above referred to, which is supposed to embody the policy of the Government in regard to this matter, the number of United States judges has been increased, as has been also the number of places in the several States and Territories at which United States courts are holden, so that the number of copies of Reports now provided is not adequate to meet the requirements of the executive and judicial officers of the Government, to whom these volumes are necessary in the discharge of their official duties.

During the last session of Congress a bill satisfactorily covering this matter was reported by the Committee on the Judiciary in the Senate and now awaits final action by that body. It is understood, also, that a similar bill was reported by a subcommittee of the Committee on the Judiciary in the House, but at too late a date to receive consideration by the whole committee. This bill should, in my judgment, receive favorable action on the part of both Houses of Congress at the earliest practicable moment after its convening in December.

COMPILED STATUTES OF THE DISTRICT OF COLUMBIA.

By the provisions of an act of Congress approved March 2, 1895, 5,000 copies of the Compiled Statutes of the District of Columbia were delivered to this Department for distribution to certain officers of the Government, and for sale at \$3.75 per copy. The distribution directed was at once made and 170 copies sold at the price named. Subsequently, upon the recommendation of this Department and in accordance with the provisions of a concurrent resolution of Congress, a further distribution was made to Members of Congress and to depositories of public documents, and the price reduced to \$2.50 per copy. Since such reduction only nine copies have been sold. There has been recently no demand whatever for the volume, of which 3,531 copies remain.

In view of these facts, it is recommended that provision be made for its further gratuitous distribution to such Senators and Representatives of the Fifty-fifth and Fifty-sixth Congresses as have not already been supplied with the work, and to such other officers of the Government as require it for their official use, and also to two additional libraries, not depositories of public documents, to be named by each Senator, Representative, and Delegate in the present Congress. This work affords an illustration of the unwise expenditure of public money in printing documents vastly in excess, as to number, of the popular demand.

SALE OF PUBLIC DOCUMENTS.

The following statement shows the number and price of the several documents sold under the provisions of a joint resolution approved March 3, 1887, authorizing the Secretary of the Interior to sell at cost any publications of the Government available for this purpose:

Publication.	Copies.	Price per copy.	Total.
Official Register of the United States:			
1889, Volume 1.....	1	\$1.35	\$1.35
1895, Volume 2.....	1	2.25	2.25
1897, Volume 1.....	6	2.00	12.00
1897, Volume 2.....	2	2.20	4.40
Land Decisions:			
Volume 1.....	21	1.05	22.05
Volume 4.....	7	1.15	8.05
Volume 5.....	19	1.05	19.95
Volume 6.....	21	1.45	30.45
Volume 7.....	20	1.10	22.00
Volume 8.....	20	1.16	23.20
Volume 9.....	21	1.15	24.15
Volume 10.....	24	1.15	27.60
Volume 11.....	23	1.10	25.30
Volume 12.....	27	1.15	31.05
Volume 13.....	27	1.15	31.05
Volume 14.....	33	1.15	37.95
Volume 15.....	34	1.05	35.70
Volume 16.....	32	1.05	33.60
Volume 17.....	36	1.05	37.80
Volume 18.....	38	1.05	39.90
Volume 19.....	41	1.05	43.05
Volume 20.....	43	1.05	45.15
Volume 21.....	58	1.05	60.90
Volume 22.....	74	1.15	85.10
Volume 23.....	96	1.05	100.80
Volume 24.....	137	1.05	143.85
Volume 25.....	110	1.05	115.50
Volume 24, in signatures, unbound.....	4	1.00	4.00
Volume 25, in signatures, unbound.....	64	1.00	64.00
Volume 26, in signatures, unbound.....	63	1.00	63.00
Volume 27, in signatures, unbound.....	1	1.00	1.00
Digest of Volumes 1 to 22.....	113	1.25	141.25
Pension Decisions:			
Volume 1.....	3	1.10	3.30
Volume 2.....	3	1.00	3.00
Volume 3.....	4	1.00	4.00
Volume 4.....	4	1.10	4.40
Volume 5.....	7	.85	5.95
Volume 6.....	5	.95	4.75
Volume 7.....	8	1.10	8.80
Volume 8.....	28	1.05	29.40
Volume 8, in signatures, unbound.....	3	1.00	3.00
Volume 9, in signatures, unbound.....	46	1.00	46.00
Digest of Decisions.....	125	1.15	143.75
Digest of Pension Laws, Rulings, etc.....	3	.25	.75
Reports of the Tenth Census:			
Final volumes—			
Forest Trees of North America.....	4	2.00	8.00
Petroleum, Coke, and Building Stones.....	3	1.75	5.25
Mining Industries of the United States.....	2	2.00	4.00
Water Power of the United States, Part 1.....	1	1.25	1.25
Water Power of the United States, Part 2.....	1	1.00	1.00
Monographs—			
Petroleum and its Products.....	1	.60	.60
Reports of the Eleventh Census:			
Abstract, first edition.....	1	.25	.25
Compendium, Part 1.....	3	1.15	3.45
Compendium, Part 2.....	3	1.10	3.30
Compendium, Part 3.....	4	1.05	4.20
Final volumes—			
Mineral Industries.....	2	1.50	3.00
Wealth, Debt, and Taxation—			
Part 1.....	1	1.20	1.20
Part 2.....	1	.80	.80
Alaska.....	1	1.15	1.15
Population, Part 2.....	1	1.10	1.10
Manufacturing Industries, Part 2.....	1	.95	.95
Transportation, Part 2, Water.....	1	.70	.70
Vital Statistics, Part 1.....	3	1.40	4.20
Real Estate Mortgages.....	1	1.15	1.15

Sale of Public Documents—Continued.

Publication.	Copies.	Price per copy.	Total.
Miscellaneous:			
The Growth of Industrial Art	29	\$2. 00	\$58. 00
Comprehensive Index of Government Publications	1	. 75	. 75
Revised Indian Treaties	10	2. 75	27. 50
Compiled Statutes of the District of Columbia	3	2. 50	7. 50
Digest of Decisions relative to Arid Regions	1	. 25	. 25
Geology of Yukon Gold District	4	. 70	2. 80
Reconnaissance of the Gold Fields of Southern Alaska	4	. 50	2. 00
Land Laws of the United States, four volumes	1	2. 50	2. 50
Mineral Resources, 1896—			
Volume 1	1	1. 00	1. 00
Volume 2	1	1. 10	1. 10
Fresh-Water Rhizopods	1	3. 86	3. 86
North American Pinnipeds	1	. 60	. 60
Map of United States	727	1. 00	727. 00
Maps of States and Territories	584	. 17	90. 28

The sum of \$4,196.84 was received by the Geological Survey from the sale of its reports. The sum received by the Patent Office from the sale of its publications is not separately shown in the report of the Commissioner of Patents giving the receipts of that office.

WASHINGTON HOSPITAL FOR FOUNDLINGS.

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Z. T. SOWERS, *President*.
Mrs. H. M. HUTCHINSON, *Vice-President*.

Mrs. L. M. SMITHE, *Secretary*.
W. F. MATTINGLY, *Treasurer*.

MEDICAL STAFF.

Z. T. SOWERS, M. D., *Chief*.
D. K. SHUTE, M. D., *Ophthalmologist*.
C. W. RICHARDSON, M. D., *Laryngologist*.
M. F. CUTHBERT, M. D.

R. W. BAKER, M. D.
S. S. ADAMS, M. D.
J. R. WELLINGTON, M. D.

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REPORT

OF THE

WASHINGTON HOSPITAL FOR FOUNDLINGS.

WASHINGTON, D. C., *August 1, 1898.*

SIR: The board of directors of the Washington Hospital for Foundlings have the honor to transmit to you the annual report of that institution for the fiscal year ended June 30, 1898, in accordance with your letter inviting attention to section 4 of the act of April 22, 1871.

Number remaining in hospital June 30, 1897..... 46

Number received during the year..... 44

Total 90

Adoptions during the year..... 13

Deaths..... 29

42

Children transferred..... 4

Number remaining June 30, 1898 44

Daily average during the year..... 38

DEATHS.

1897—July 10

August 3

September 3

October 3

December 4

1898—January..... 2

February..... 2

April..... 1

June..... 1

Total 29

Of this number 18 were under 6 months of age, seven were under 9 months, and four had just passed the twelfth month.

Physician's report.

Diagnosis.	Cured.	Improved.	Died.	Total.	Diagnosis.	Cured.	Improved.	Died.	Total.
Athrepsia.....	2	1	0	2	Indigestion, intestinal.....	15	12	1	27
Birth, premature.....	5	2	2	9	Laryngismus, stridulus.....	2	1	1	3
Colitis.....	5	5	1	11	Meningitis, tubercular.....	1	1	1	3
Colitis, entero.....	1	1	2	4	Nephritis, acute.....	1	1	1	3
Congestion, pulmonary.....	1	1	1	3	Ophthalmia.....	5	2	1	8
Conjunctivitis, syphilitic.....	1	2	1	4	Osteomyelitis (thigh).....	1	1	1	3
Eczema.....	1	1	1	3	Pneumonia, broncho.....	1	1	1	3
Enteritis.....	3	3	9	15	Pneumonia, croupous.....	1	1	1	3
Enteritis, gastro.....	3	4	7	14	Scarlatina.....	1	1	1	3
Furunculosis.....	12	1	13	26	Somatitis.....	3	1	1	5
Gastritis.....	1	1	1	3	Syphilis, congenital.....	1	2	2	5
Grippe.....	9	1	9	19	Tuberculosis, general.....	1	1	1	3
Heart, congenital malformation.....	1	1	1	3	Total.....	70	20	29	119
Indigestion.....	3	3	3	9					

Statement of receipts and expenditures from June 30, 1897, to June 30, 1898, inclusive.

RECEIPTS.

Balance on hand June 30, 1897	\$757.66
Cash: Mr. Michael Briel (endowment fund)	3, 776.92
Dues and contributions	815.80
Entertainments	135.50
United States appropriation ending June 30, 1898.....	6, 000.00
Total	11, 485.88

DISBURSEMENTS.

By maintenance:	
Salaries and wages.....	3, 080.67
Provisions, groceries, and ice.....	1, 675.42
Nursery food, milk.....	952.38
Fuel and gas.....	789.77
Repairs and improvements	476.87
Druggist's supplies	172.94
Printing, advertising, and stationery.....	93.06
Furniture and house furnishings	91.59
Insurance	40.00
Rubber goods and dry goods	26.79
Miscellaneous.....	50.00
Total	7, 449.48
Cash balance on hand June 30, 1898	4, 036.40

Not since the hospital was opened in 1887 has the average number of children been as large as during the past year. Necessarily the expenses have been proportionally greater.

In order to carry on the work of beneficence the board is compelled to ask that the appropriation of \$6,000 may be continued for 1899-1900.

Respectfully submitted by the board of directors.

Z. T. SOWERS, *President.*

The honorable the SECRETARY OF THE INTERIOR.

REPORT
OF
THE MARITIME CANAL COMPANY OF NICARAGUA FOR THE YEAR 1898.

DEPARTMENT OF THE INTERIOR,
Washington, December 5, 1898.

SIR: I have the honor to transmit herewith for the information of the Senate the report of the Maritime Canal Company of Nicaragua, submitted to the Department this day, in accordance with section 6 of the act of Congress approved February 20, 1889, entitled "An act to incorporate the Maritime Canal Company of Nicaragua."

Very respectfully,

O. N. BLISS, *Secretary.*

The PRESIDENT OF THE UNITED STATES SENATE.

THE MARITIME CANAL COMPANY OF NICARAGUA,
New York, December 5, 1898.

SIR: Pursuant to section 6 of the act entitled "An act to incorporate the Maritime Canal Company of Nicaragua," approved February 20, 1889, which provides that the said company shall make a report on the first Monday of December in each year to the Secretary of the Interior, and in accordance with instructions prescribing the form of such report and the particulars to be given therein, the said Maritime Canal Company of Nicaragua reports as follows:

First. That the regular annual meeting of the company was held at No. 54 Broad street, in the city of New York, on the 5th day of May, 1898, pursuant to the provisions of the by-laws, and that at such meeting Messrs. Charles P. Daly, Daniel Ammen, Horace L. Hotchkiss, Henry E. Howland, and Robert Sturgis were duly elected directors of said company, to fill the places made vacant by the class whose term of office expired on the 5th day of May, 1898, and to serve for the period of three years, as provided for in the said act of incorporation. On

the 11th day of July Rear-Admiral Daniel Ammen, U. S. N., one of the directors, died. His death leaves a vacancy in the class of 1901, which has not yet been filled.

Second. That the board of directors of said company as now constituted is composed of the following stockholders:

Class of 1901.—Charles P. Daly, Horace L. Hotchkiss, Henry E. Howland, and Robert Sturgis.

Class of 1900.—Frederick F. Thompson, Aniceto G. Menocal, Samuel E. Kilner, Alexander T. Mason, and George West.

Class of 1899.—Joseph Bryan, James Roosevelt, Hiram Hitchcock, and Thomas B. Atkins.

The above-named directors are citizens and residents of the United States.

Third. That at the first meeting of the board of directors held after the said annual election the following officers were duly elected to serve for the ensuing year, to wit: President, Hiram Hitchcock; vice-president, Charles P. Daly; secretary and treasurer, Thomas B. Atkins. All of the officers so elected are citizens and residents of the United States. That at said meeting the following directors were elected members of the executive committee, as provided for in the by-laws of said company, to wit: James Roosevelt, chairman; Hiram Hitchcock, Henry E. Howland, Frederick F. Thompson, and Alex. T. Mason.

Fourth. That since the organization of the Maritime Canal Company of Nicaragua 10,145 shares of the capital stock of said company have been subscribed for at par, amounting in the aggregate to the sum of \$1,014,500, of which amount \$1,007,840 has been paid into the treasury in cash; that there has been paid into the treasury from other sources \$142,581.89, making the total amount of cash received \$1,150,421.89.

Fifth. That since the organization of the company it has paid for property, work and labor done, and materials furnished in the execution of the work of construction of canal and in administration expenses the sum of \$1,146,330.58 in cash, 31,990 shares of the full-paid capital stock of the company of the par value of \$3,199,000, \$150,000 of its first-mortgage bonds, and its obligations for \$6,705,000 of the said first-mortgage bonds. It has also issued 180,000 shares of its capital stock, of the par value of \$18,000,000, in payment for concessionary rights, privileges, franchises, and other property. Two hundred and twenty-five thousand dollars of the amount first named was represented by a claim against the Nicaragua Canal Construction Company for cash advances made on account of purchase of equipment, and in liquidation of which claim the Maritime Canal Company has received and now holds in its treasury obligations representing \$518,500 of its first-mortgage bonds, in addition to 2,420 shares of its capital stock, which were transferred and delivered to Thomas B. Atkins, trustee, in liquidation of said account, to be held by him as trustee for the benefit of the company.

Sixth. That the liabilities of the company consist of the amounts still due under the concessions granted to the company, of the \$6,705,000 of bonds before mentioned, the said bonds being due to the assignees of the Nicaragua Canal Construction Company for work and labor done and materials furnished in the execution of the work of constructing the interoceanic canal, and of cash liabilities outstanding unpaid to an amount not exceeding \$100,000.

Seventh. That the assets of the company consist of its unused capital stock, of the \$518,500 first-mortgage bonds, and the 2,420 shares of capital stock received in liquidation as aforesaid, the concessions, rights, privileges, and franchises which it now owns, and of the plant,

equipments, materials, lands, buildings, structures, railways, steamboats, telephone and telegraphic lines, dredges, locomotives, cars, machinery, stores, machine shops, supplies, and other property in Central America, including the lands situated between the lake and the Pacific, purchased from the Government of Nicaragua for the route of the canal, in accordance with the provisions of the Nicaraguan concession.

Work on the canal is at present suspended, for reasons given in our last annual report.

By authority of Congress, the President of the United States appointed a commission of engineers to examine and report upon the route and surveys of the Nicaragua canal; and this company placed its surveys, maps, etc., at the disposal of the commission.

In response to your communication of May 17 last, calling for information, the company reported on the 4th day of June as follows:

FIRST. PROGRESS MADE AND WORK DONE.

The axial and detailed surveys of the proposed interoceanic canal, its harbors, locks, and other accessory works, were completed in 1889, and the final location of the route from ocean to ocean practically determined. This vast and most important work was accomplished at a great expense of time, labor, and money. The engineers employed were of known and tried ability. Those in positions of chief responsibility had had extensive practice in works of engineering construction in the United States and the Tropics. The engineers, administrative staff, surveyors, and nearly all the skilled mechanics were hired in the United States and sent out under contract for at least a year's service, and several were continuously employed in Nicaragua for upward of three years. A detailed description of the proposed canal and the work to be accomplished in its construction, together with the maps showing the route thereof, as the same was finally located, was annexed to the annual report of the company for the year 1890, to which reference is hereby made for said particulars. No great public work has ever been so thoroughly and conscientiously surveyed, and the company has entire confidence in the surveys and in the estimates of cost.

In the location of the canal line the route chosen from among the many tentative lines run was that which presented the fewest difficulties. It was expected that possible changes might suggest themselves as the work progressed, but no change from the location first decided upon has since been made, except as further examination and studies have demonstrated the certainty of betterments, either by shortening the length or decreasing the difficulties and cost of construction. One or more parties of engineers have been engaged in critical examination of the topography at certain localities where previous surveys had suggested that betterments in the location or design might be practicable. In some cases, after very close examination and study, their hopes were not realized, but in one instance instrumental examinations have completely demonstrated not only the practicability, but the economy, to result from a rectification of the line.

The location previously adopted between the sites of Locks Nos. 2 and 3, involved a curve of large radius in the sailing line through the second Deseado Basin. It is now found that this curve may be eliminated, with a saving in distance of upward of 1,000 feet and a saving in earth excavation of upwards of 600,000 cubic yards. A site for the Ochoa Dam has been located about half a mile below that originally chosen. The borings prove its suitability of foundation without material increase of cost over that already assigned in the estimates, and another curve in the sailing line may be eliminated and a large reduction in mass of excavation will be possible. A party of engineers was for many months engaged in boring the strata at the proposed site of La Flor Dam, which is located about 3 miles from the Pacific terminus. The results demonstrate the certainty of securing a good foundation for the dam and for the locks which are to be built at this point.

A party of engineers was also engaged for many weeks in further surveys for the minor canal required under the concession to be built between Lake Nicaragua and Lake Managua, for steamboat navigation, known as the Tipitapa Canal. This work, with the additions desired by Nicaragua, has been thoroughly studied and plans prepared for completion. At the Machuca Rapids, in the San Juan River, a considerable mass of rock has been removed, improving the navigation of the river at that point.

Criticisms of the route and surveys have prompted reexaminations, which have, in almost every instance, verified the correctness of the original surveys and estimates.

For example, it was said that the Ochoa Dam was impracticable for want of rock foundation; but borings have revealed solid rock under the entire bed and banks of the river at that point. Later examinations show that there is less rock than was expected to be removed from the bed of the San Juan River, and that there will be about 3 miles less than the estimated dredging at the outlet of the lake.

Several months elapsed after the completion of the surveys before the voluminous plans and drawings prepared by the company were approved by the Government of Nicaragua and the formal commencement of construction authorized, during which time a corps of engineers was kept constantly employed and much valuable preparatory work was done, such as the commencement of the erection of permanent quarters, wharves, storehouses, clearing the ground, and accumulating supplies, tools, machinery, etc.

The necessity of securing a safe entrance from the Atlantic to the old port (which until 1860 was easily accessible to vessels of upward of 20-foot draft) was realized as indispensable to economical and rapid progress, and therefore the first work of actual construction was in execution of the engineers' plans for restoring the harbor. One of the means to accomplish this end was the erection of a breakwater to protect the entrance. This massive work, which will ultimately absorb much of the rock excavated from the divide cut, has been pushed out about 1,000 feet, and has been filled in with brush mattresses, rock, and hydraulic-cement concrete.

Quarters for accommodation of the workmen and storage for supplies were created near this work, and a railroad track was laid upon the breakwater and extended landward to facilitate the handling of building material and other supplies. The bar in front of the old San Juan Harbor has, since 1860, been one of the most difficult on the coast. The breakwater was constructed from the beach to and across this bar, and although it encountered the full force of the waves, it was carried forward through the heavy surf without interruption on account of the weather and without accident of any kind. As it advanced it afforded a partial shelter to the beach to leeward and also served as a barrier to the moving sand, which, impelled by the currents and prevailing winds and driven constantly to the westward, built up and maintained the sand spit that thirty years ago closed the old port of San Juan. This artificial interruption to the operation of the winds and current permitted countervailing forces of nature to come into play, so that by the time the pier had been pushed out 600 feet the sand beach under its lee was swept away and a channel formed communicating from the open ocean to the old harbor, and restoring it to the extent of permitting the entrance of light-draft seagoing vessels at a point where, six months before, there was a sand bank 3 or 4 feet above sea level. The attainment of this result was without the assistance of any dredge or any artificial aid other than that afforded by the breakwater.

It is evident from this experience that the plan of the engineers for the restoration of the port of San Juan is not only theoretically sound, but practicable. Although, since cessation of work, variations have occurred in the conditions of the channel, which at times has been nearly closed, yet it only remains to extend the pier to the proposed length in order to realize complete and satisfactory results, which no doubt can be maintained with, at most, but temporary and inexpensive dredging.

The construction of permanent buildings was begun in the summer of 1889. The completed structures are all of wood (pine from the United States), and are roofed with corrugated galvanized iron. The offices, quarters, and hospitals are neat and comfortable, being ceiled and painted, and provided with wide verandas outside. The permanent buildings thus far erected are in the immediate vicinity of San Juan, where the general headquarters are located and where the most important operations have been concentrated. They consist of five groups, covering an area of about 1½ acres, and have a floor space as stated below:

	Square feet.
Headquarters	13, 986
Hospital	14, 174
La Fe depot	21, 864
Railroad headquarters	18, 778
Camp Cheney	7, 100
Total	75, 902

Besides the above, numerous and extensive wharves equipped for unloading freight, sheds, small outhouses, water tanks, etc., were constructed. The machine and smiths' shops were equipped with a varied and extensive assortment of modern tools. A tramway connects the more important of these establishments.

Work in clearing the canal line of forest growth was begun near Greytown in January, 1890, and for a distance of about 10 miles back from the coast a clearing has been made of 486 feet in width. Similar work was commenced on the west side of Lake Nicaragua in the month of November, 1890, and for 9 miles the ground there is ready for construction work. The company paid the Government of Nicaragua \$50,000 for the lands required from the lake to the Pacific Ocean.

A telegraph line to the interior, connecting with the telegraph systems of the country and the ocean cables, was one of the first works commenced, and it was soon pushed through to Castillo, covering, with its loops, a distance of 60 miles. In addition to this telegraph service, all the offices and the more important camps and stations were put in telephonic communication.

As the heaviest single body of work to be accomplished on the whole line is concentrated within a distance of 3 miles at the rock cutting, the "Eastern Divide," and as the time required to complete the canal will necessarily be measured by the time spent in opening this deep cut, it was considered important to install a plant for the work at the earliest date possible. The difficulties of transporting to the divide the quantity of machinery, etc., needed for the heavy rock cutting to be done at that point made requisite the immediate construction of a railroad. This work was commenced in the summer of 1890 and was pushed forward with marked success. The line traverses what has always been considered an impassable swamp, and for the first 10 miles there are but 4 miles of hard ground. Soon after beginning the roadbed heavy rains set in and the swamp was flooded to a depth of from 1 to 4 feet.

All the earth used for filling had to be brought from a distance by construction trains, which necessitated laying the track first and making the required embankment afterwards. To accomplish this a heavy corduroy of logs was laid for many miles. These logs, which were procured from the neighboring forest, were rolled, floated, or dragged by man power alone to the line of the proposed track, and there laid transversely as compactly as possible. Upon them were placed longitudinal stringers, consisting of native tree trunks, on which the railroad ties were laid, and upon these the steel rails were then spiked down. Trains loaded with earth were run out over the structure and the earth dumped and packed into the interstices and under the ties, which were raised gradually by the workmen, until the desired grade was secured. There were 6 miles in all of this construction through swamps, the men working most of the time in water reaching above the knees and often to the waist or armpits. The material used for grading and ballasting the first 8 miles of the roadbed was taken from the canal prism near the harbor, and distributed along the line by construction trains, the cars being loaded by means of a steam shovel or navy, capable of delivering 1,300 cubic yards per day.

There are several places along the railway where streams and other water courses are crossed. These are spanned by pile bridges, and a powerful steam pile driver was used in their construction. The portion of road already completed is the most difficult of the whole line, and but 7 miles now remain to be built to reach the Eastern Divide. There are several miles of side track, switches, etc., already in place, and the road is equipped for construction work with 4 locomotives, 50 cars, steam shovel, ballast unloader, and all other requisite appliances. All the cross-ties and bridge timbers are of Northern pine, charged with 16 pounds creosote oil to the cubic foot. At the terminus of the harbor is a fine wharf, 264 feet long, built in the best manner of creosoted timber and equipped with modern steam conveniences for handling freight rapidly. The survey for the remainder of the line, extending to the San Juan River at Ochoa, has been completed; in fact, two locations have been surveyed and profiles prepared in sufficient detail to permit accurate estimates of cost. Between Lake Nicaragua and the Pacific the railroad line is also located and everything made ready for its construction, which must necessarily precede the inauguration upon a larger scale of the work of excavation.

In the summer of 1890 there was purchased from the American Contracting and Dredging Company the extensive and valuable plant used so successfully on the eastern end of the Panama Canal. The property consisted of 7 dredges, then the most powerful ever built, 2 fine tug boats, 20 lighters, several launches, the equipment of an entire machine shop, stationary engines, pumps, and a vast quantity of tools, spare parts, materials for repairs, etc. Dredging on the canal line west of the harbor was carried forward, and a point well inland was reached by an open channel 17 feet deep and varying in width from 150 to 230 feet, which drains the swamp and lowers the level of the swamp waters, thereby securing for the railroad embankment immunity from injury by flood waters. No obstructions to free dredging have been encountered so far, although the canal has now been opened for a distance of about 8,750 feet.

Natives of Central America and negroes from the island of Jamaica have been employed for unskilled labor, and all employees have been not only housed and fed by the company, but also supplied with medicine and hospital attendance. The rate of wages paid to ordinary laborers varies from 20 to 30 soles per month, and it is evident from past experience that an abundance of acclimated labor, entirely adapted to the company's needs, is readily obtainable from the localities named. No Chinese or other Asiatic workmen have been employed.

In addition to the results already achieved, as hereinbefore set forth, the company organized and established in Nicaragua a complete hospital service and perfected the sanitary arrangements in and about its camps and headquarters. In the early

part of 1889 the medical work was carried on by assistant surgeons located at different points along the canal route, but the department was not regularly organized until October of that year, when a chief surgeon was appointed and the hospital at headquarters was virtually completed and made ready for occupation.

The hospital consists of 13 buildings, of which 5 are two-story structures surrounded by broad verandas. The remaining buildings of the group are one-story structures, for the most part build of wood. The total capacity of the hospital is 125 beds. It is situated on the beach, about 500 feet from the surf, and was equipped with a first-class pharmacy and operating room. In 1890 it was found necessary to erect, 8 miles up the railway line, at Camp Perez, a temporary hospital, known as Temporary Hospital No. 1, accommodating about 50 patients. This hospital consists of one large building, containing, in addition to the general laborers' ward, a pharmacy and nurses' rooms. A second building was erected for culinary purposes. Medical stations were established and operated at different times at points remote from the hospitals, according to the necessities of the work. They were established at Camp Francis, on the beach; Carazo, on the San Juan River; Poco-Mas-Arriba; Satisfaction, on the Deseado River; Lake Silico, San Francisco River, and at Railway Camp No. 1. These stations are all on the Atlantic division.

On the Pacific division stations have been operated at different times at Rivas and Tipitapa. In connection with headquarters hospital an efficient ambulance service was maintained. The company also operated a road ambulance to stations on the beach and a car ambulance between the hospital and La Fe, at which latter place connections were made with the railway terminus, the navigation docks, and the breakwater. On the railway line an ambulance caboose car was used. Any existing opinion regarding the unhealthfulness of the climate in Nicaragua is erroneous. Far removed from the severity of the northern winters, though geographically in the Tropics, the temperature is moderate and equable throughout the whole year. The northeast trade winds temper the atmosphere and have a marked influence. The mean temperature during 1890 was 77.25° F. In 1891 there was an extreme range of 28°, from a minimum of 67° to a maximum of 95°, or a mean of 81° F. This difference of mean temperature was probably due to the decrease of the annual rainfall.

It has been asserted that the country teems with fatal maladies, and that the canal employees would be exposed to severe types of fever as soon as the work of excavation was commenced. This, however, has not proved to be the case, as an examination of the records and statistics kept by the medical department will show. The dredges have already advanced over a mile into the swamps without encountering anything but sand and light loam, which, exposed to the sun, produces no unusual sickness, and the borings prove that the soil as far as the foothills, or the entire width of the swamp lands, is of a similar character.

Most of the diseases met with have been mild in type. This is especially true of bronchitis and pneumonia. The cases of fever are of the remittent or intermittent type, very amenable to treatment, and not of as long duration as in the United States. Chagres fever is entirely unknown as an epidemic disease, and in 1890, when a number of cases were brought on towing steamers in the service of the company from Colon to Nicaragua, every one taken to the canal hospital recovered, while of those admitted from the same ships to the Colon hospital a number died. It is proper to say that the medical organization and the system of sanitation inaugurated by the company proved itself to be exceedingly valuable in maintaining a death rate which is not only very greatly below that of any other known large work of construction in its hospital records, but also is very materially below the death rates of hospitals in the United States.

These results may be summarized as follows:

- (1) The prosecution and completion of the final surveys for location and construction and surveys for economical improvements as to details.
- (2) The subterranean examinations of the strata requiring removal by means of borings with the diamond drill.
- (3) The demonstration of the practicability and safety of the required harbors.
- (4) The construction of extensive wharves and landing facilities.
- (5) The erection of permanent buildings for offices, quarters, hospitals, storehouses, shops, etc.
- (6) The building of a large number of temporary camps along the line for accommodation of employees.
- (7) The completion of a telegraph line permitting ready communication with the work.
- (8) The clearing of the canal line of timber for some 20 miles.
- (9) The completion of surveys for location and of plans for construction of the railroad system, and the construction and equipment of 11 miles of this line.
- (10) The acquisition of valuable and extensive plant.
- (11) The opening of over a mile of the canal.

(12) The acquirement from F. A. Pellas, in accordance with the Nicaragua concession, of the exclusive franchise for the steam navigation of the San Juan River and Lake Nicaragua.

(13) And lastly, what is felt to be the most important result of all, is the demonstration, secured by experience, of the salubrity of the climate, the efficiency of labor, and the sufficiency of the estimates of the chief engineer for the harbor and canal dredging and railroad work.

The Government of Nicaragua, by a communication dated November 8, 1890, has officially recognized and declared that the company has more than complied with the provisions of article 47 of the concession, requiring the expenditure of \$2,000,000 during the first year of the work. This formal acknowledgment confirms the company's title to the concessionary rights for a term of ten years in which to complete the canal, and to extensions contemplated in the concessions.

In justice to the company the statement should be made that many thousands of dollars were expended by the company in reopening the route for, and in otherwise aiding, the Nicaragua Canal Commission, appointed by authority of Congress in 1895.

SECOND. PROPERTY AND PRESENT CONDITION.

The accumulated property before referred to is represented by surveys, solutions of important problems, works of construction, plant, etc.

The company holds the concessions from Nicaragua and Costa Rica, and the charters from the United States and the State of Vermont. The concessions concede to the stockholders of the company 6 per cent of the company's securities. These franchises and all that they include and imply, as the basis upon which the enterprise must necessarily rest, are of great value, and they are not likely to be ever again so potently and completely associated together.

These concessions convey most valuable rights of navigation of the San Juan River, and other riparian rights. The concession from Nicaragua carries land estimated at 1,000,000 acres in extent, and that from Costa Rica lands estimated at 300,000 acres, the total value of which, including mining rights, must be very large.

In August, 1893, work of construction was suspended (as has been stated in annual reports of the company) because of the financial embarrassment of the construction company which had contracted for the construction of the canal. Since the suspension of construction the company has endeavored to protect all of its property, in order that it may be available on the resumption of work. In that climate, however, deterioration is rapid, and the dredges especially have suffered accordingly. The canal excavations retain their original depth and form, and the embankments are undisturbed. The buildings, railroad, and equipment are in fair conditions, all things considered. The great breakwater, 1,000 feet long, at the entrance of the canal is permanent and solid, and fully meets the expectations of the engineers.

THIRD. EXPENDITURES.

Since undertaking the canal enterprise the company (including its agents) has expended—

For preliminary expenditures incident to procurement of concessions..	\$280,000.00
For surveys, plant, construction, navigation, rights, and lands.....	4,287,736.73
For administration and care of property	268,692.24

	4,836,428.97
Cash obligations, estimated	300,000.00
	5,136,428.97

The interest on these expenditures to June 1, 1898, at 6 per cent, would amount to \$1,864,420.

FOURTH. THE BOND AND STOCK OBLIGATIONS.

Bond obligations for work done	\$6,855,000
Less bonds taken in liquidation	518,500

Net bond obligations	6,336,500
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Stock sold.....	1,014,500
Stock paid for concessions	12,000,000
Stock issued to Nicaragua	6,000,000
Stock to be issued to Costa Rica	1,500,000
Stock paid for work	\$3,199,000
Less stock taken in liquidation.....	242,000
	2,957,000

Total stock obligation	23,471,500
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The company now calls your attention to the statement made by its president to the Select Committee of the United States Senate on the construction of the Nicaragua Canal, January 28, 1897, as to the relations between the company and the Governments of Nicaragua and Costa Rica, and printed as Senate Doc. No. 102, Fifty-fourth Congress, second session, and now annexed to this report as Exhibit A.

On the 15th of June, 1897, the Government of Nicaragua made a contract with the Atlas Steamship Company, an English corporation, granting the latter navigation rights on Lake Nicaragua and the San Juan River and other privileges, which contract conflicts with the concession held by this company.

On the 24th day of February, 1898, the Government of Nicaragua made a contract with J. La Motte Morgan, authorizing him to obtain the recognition, in any bills before the United States Congress, of the right of Nicaragua to 6 per cent of bonds as well as 6 per cent of stock of the Maritime Canal Company. Mr. Morgan presented the subject to the company and demanded 6 per cent of the bonds, and was informed that the company's construction of article 50 of the concession did not warrant this claim of Nicaragua, and that, while the company would be pleased to have Nicaragua receive every benefit to which she could possibly be entitled, yet this difference of construction of article 50 could only be adjusted by arbitration, as provided in article 55. This proposed arbitration was declined.

On the 15th of August last the president gave you information about a certain syndicate and wrote as follows:

The Maritime Canal Company was chartered by Congress in the face of a combined European and American opposition. Its stock, under the terms of the concessions, was publicly offered to the people of the nations of the world. The amount subscribed was by the incorporators, who still retain it, and whose faith in the enterprise has never wavered. They made the payments and expenditures required under the terms of the concessions. Soon afterwards a resolution was offered in the United States Senate and referred to the Committee on Foreign Relations, directing an examination into the affairs of the company, with a view to ascertaining what part, if any, the Government of the United States should take in the construction of the canal. This led to the introduction of a bill amending the charter, which has since been followed by many bills of similar purport. The effect of the proposed Congressional legislative action has been to cause capital, at home and abroad, to say that it would await such action; or to say that only the Government itself could construct and protect so large a work with such vast international relations and responsibilities. The financial panic of 1893 caused the cessation of work by its agents.

This condition of affairs has necessarily led to a waiting attitude on the part of the company, during which time its franchisees and possessions have been actively coveted by aspiring rival routes and interests, sometimes under the indirect inspiration of foreign powers; and it has encountered criticisms and direct opposition of enemies in the United States and Central America.

In the face of all this, the company has remained solvent and faithful to its trusts, and it has protected the enterprise and preserved it for the people and Government of the United States. Now that what the company has believed in and patiently labored and waited for these long years has recently been so clearly demonstrated to the understanding of everyone to be a national necessity, it occurs, as before in human experience, that others wish to acquire it. But it would be a work of manifest injustice for any combination of our citizens at this late day, directly or indirectly, to attempt to supplant this company of American citizens in the rights and property of an enterprise they have so truly conserved until all could clearly see that the fullness of time had come.

Congress has the right to amend the charter of the company in such terms as it deems wise, and can therefore make its own conditions. If it provides funds for the construction of the canal, the canal is in reality constructed from that hour.

The Maritime Canal Company of Nicaragua has only the desire that the canal may soon be a reality, whatever the result may be to its incorporators; and it confides in the honor and justice of the Government that created it.

The syndicate referred to was formed and parties representing it went to Nicaragua and Costa Rica to obtain concessions. Later the syndicate became convinced that it was unwise to obtain concessions under existing conditions, and it dissolved.

The Government of Nicaragua, however, without being informed of this dissolution, entered into an agreement with the parties claiming to represent the syndicate, which agreement is in violation of the rights and interests not only of this company, but of the United States and of Costa Rica.

In witness whereof the Maritime Canal Company of Nicaragua has caused its corporate seal to be hereunto affixed and these presents to be signed by its president and secretary this 5th day of December, A. D. 1898.

[SEAL.] THE MARITIME CANAL COMPANY OF NICARAGUA,
HIRAM HITCHCOCK, *President*.
THOS. B. ATKINS, *Secretary*.

HON. C. N. BLISS,
Secretary of the Interior.

STATE OF NEW YORK,
City and County of New York, ss:

Hiram Hitchcock, being duly sworn, says that he is the president of the said The Maritime Canal Company of Nicaragua; that he has read the foregoing annual report and knows the contents thereof, and that the same is in all respects correct and true.

HIRAM HITCHCOCK.

Sworn to before me this 5th day of December, 1898.

[SEAL.] V. BIGELOW,
Notary Public, New York County.

STATE OF NEW YORK,
City and County of New York, ss:

Thomas B. Atkins, being duly sworn, says that he is the secretary of the said The Maritime Canal Company of Nicaragua; that he has read the foregoing annual report and knows the contents thereof, and that the same is in all respects correct and true.

THOS. B. ATKINS.

Sworn to before me this 5th day of December, 1898.

[SEAL.] V. BIGELOW,
Notary Public, New York County.

STATE OF NEW YORK,
City and County of New York, ss:

On the 5th day of December, in the year 1898, before me personally came Thomas B. Atkins, known to me to be the secretary of The Maritime Canal Company of Nicaragua, and with whom I am personally acquainted, who, being by me duly sworn, did depose and say that he resided in Roselle, N. J.; that he was the secretary of The Maritime Canal Company of Nicaragua; that he knew the corporate seal of said company; that the seal affixed to the foregoing report was such corporate seal; that it was so affixed by the order of the board of directors of said company, and that he signed his name thereto by the like order as secretary of the said company.

And the said Thomas B. Atkins further said that he was acquainted with Hiram Hitchcock, and knew him to be the president of said company; that the signature of the said Hiram Hitchcock subscribed to the said instrument was in the genuine handwriting of the said Hiram Hitchcock, and was thereto subscribed by the like order of the said board of directors, and in the presence of him, the said Thomas B. Atkins.

In witness whereof I have hereunto set my hand and official seal this 5th day of December, 1898.

[SEAL.]

V. BIGELOW,
Notary Public, New York County.

EXHIBIT A.

[Senate Document No. 102, Fifty-fourth Congress, second session.]

Mr. MORGAN, from the Select Committee on the Construction of the Nicaragua Canal, reported the following

STATEMENT, MADE ON EXAMINATION, BY HIRAM HITCHCOCK, PRESIDENT OF THE MARITIME CANAL COMPANY OF NICARAGUA, AS TO THE EXISTING RELATIONS BETWEEN THAT COMPANY AND THE GOVERNMENTS OF NICARAGUA AND COSTA RICA.

THURSDAY, *January 28, 1897.*

The committee met at 10.30 a. m.

The CHAIRMAN. This meeting has been specially called to hear the statement of Mr. Hiram Hitchcock, president of the Maritime Canal Company of Nicaragua, who has been summoned by the committee to give the committee information with reference to the Canal Company.

I will first ask you, Mr. Hitchcock, what differences, if any, your company has had with the Governments of Nicaragua and Costa Rica in connection with the building of the canal?

Mr. HITCHCOCK. The same is true with regard to any substantial differences as was true when I was first called before the Senate Committee on Foreign Relations, June, 1890. I then said:

I may as well perhaps say, as you ask me the question, with reference to that, that there is no point of difference remaining unsettled between the company and Nicaragua at the present time. That leads me to say (without assuming to be able to give you gentlemen the least information on that point) that it is proper that you should know from us officially the relations which exist between us and Nicaragua, and in fact Central America generally. It is, as I said before, perhaps unnecessary to state these facts, but there are complicated questions. The rights to the San Juan River, the boundary questions between Nicaragua and Costa Rica, always come up when any question of transit across that isthmus arises. You will find that under Tyler's Administration, in 1842, this matter was somewhat considered by Mr. Webster, and it has been before every Secretary of State in some aspect from that time to this. It involves the canal question. Now, the question of the respective rights in this particular route was supposed to have been settled under the treaty of limits between those two powers of 1858. Under that treaty, while Nicaragua owns the entire route, yet Costa Rica has the right to navigation and has the right to be consulted.

Now I come down to the point where it concerns this particular concession. The Nicaragua Canal Association, which was formed in 1886, sent out early in 1887 to obtain a concession to build this canal. Nicaragua had the right to give this concession, and in it gave us the fullest freedom to locate the route; but, for the reason that the treaty of 1858 gives to Costa Rica the right of navigation and that, in the construction of the canal, waters would be made to overflow Costa Rican territory, Costa Rica took the ground that Nicaragua should have recognized that treaty to the extent at least of obtaining the consent of Costa Rica to this concession. Nicaragua did not do that. We accepted the concession in good faith, believing Nicaragua had the absolute right to grant it. The first thing we encountered was a protest, thirty or forty days thereafter, from Costa Rica, announcing that the concession was of no value because she had not been consulted. The Government of Nicaragua could have

consulted her before, and have gone on and satisfied her for any damages which the overflow might do to her territory, but we were left to make terms with Costa Rica. We then for six months negotiated to obtain a concession from Costa Rica, when this was accomplished. Nicaragua immediately protested against our concession from Costa Rica. We assured Nicaragua that we had accepted the concession from Costa Rica simply in the nature of a quitclaim of any rights she might have; and when we formed our company and accepted the Costa Rica concession we accepted it only in so far as it did not conflict with the territorial rights and proprietary interests of the Republic of Nicaragua. Thus we were entirely open and frank in the whole transaction.

Now, you will readily see that up to that point it was useless to talk about the sale of bonds with the protest of either Government pending. Then when the first expedition sent out after the Maritime Company was organized commenced work on the 3d of June, 1889, Nicaragua officially notified us that, while she would protest against our concession from Costa Rica, yet she would not go beyond protesting and would not interfere with the construction of the canal. But in July Nicaragua ordered the stopping of our work at Greytown. We did not pay attention to that order, because she immediately modified it by saying that she would not regard the work as an official commencement of permanent work. The troubles continued and were fostered by parties from England, whose names I know, who wanted to have the 24th day of October arrive and the Government of Nicaragua not recognize that we had begun our work, so that our concession would lapse. On the 16th of September, 1889, the Government of Nicaragua notified us officially that if we did not confine ourselves within her limits, thereby ignoring any rights or claims of Costa Rica, she would not approve our surveys nor recognize the commencement of the work of construction, and that on the 24th of October she should consider our concession as having lapsed.

This course of Nicaragua was so unjust that I went immediately to the Government here, through the State Department. I stated the case fully. Mr. Blaine met the question with great fairness and promptness, and immediately wired to the American minister at Central America (Mr. Mizner) to go to Nicaragua and say to the Nicaraguan Government that he was surprised at the report of the attitude of the Nicaraguan Government toward this company, and wished him to examine into the facts and report to the State Department here, and at the same time to assure the Government of Nicaragua that the Government of the United States would not remain passive and see the rights of its citizens threatened. That dispatch of Mr. Blaine had the desired effect. Mr. Mizner and Mr. Hall, our permanent agent there, arranged a plan by which Nicaragua could recede from her position with dignity, which was in the form of a joint declaration. On our part we agreed to go on and build the canal in good faith under the concession and the Nicaraguan Government agreed to approve the surveys and work, so that the work of construction was recognized officially as commenced on the 8th of last October. I will submit copies of the telegrams between the President of Nicaragua and myself.

[Copy of telegram sent October 9, 1889.]

His Excellency **PRESIDENT OF NICARAGUA,**

Managua:

Please accept my sincere congratulations upon the happy termination of all differences, and the company's assurance that it will vigorously prosecute the work of the canal in the interest of Nicaragua and the whole commercial world.

HIRAM HITCHCOCK,
President Maritime Canal Company of Nicaragua.

[Translation of telegram received from the President of Nicaragua in reply to ours of October 9.]

MANAGUA, October 11, 1889.

President of the Maritime Canal Company of Nicaragua:

I congratulate myself jointly with you upon the happy settlement of the canal question, and with the greatest satisfaction I offer the cordial assistance of my Government to the efforts of the company for the realization of this grand enterprise.

ROBERTO SACAIA,
President of the Republic.

Mr. Hitchcock explained that this was mainly a repetition of his statement before the Committee on Foreign Relations, June 5, 1890.

The **CHAIRMAN.** Mr. Hitchcock, will you please relate to the committee in detail your interview with Mr. Blaine just referred to?

Mr. HITCHCOCK. I have here a memorandum, made at the time, of a confidential interview with the Hon. James G. Blaine, Secretary of State, in Washington, on the 7th of May, 1889, at which were present ex-Chief Judge Charles P. Daly, Engineer A. G. Menocal, and myself. I stated to Mr. Blaine that the Maritime Canal Company of Nicaragua, chartered by Congress, had just been organized, and recited to him the history of the enterprise up to that time, including some of the numerous interests opposed to the construction of the canal, and that the opposition had in vain endeavored to induce President Cleveland not to sign the charter of the company. The last move of the enemies of the canal was to bring an ineffectual suit in New York to prevent our organizing under the charter of the United States.

Mr. Blaine gave us some valuable information with reference to the relations of the United States to the Central American States and then said that the canal must be built and controlled by the United States, and he believed that more tonnage would pass through it in a short time after its construction than was passing through the Suez Canal. I suggested to Mr. Blaine that it might be proper for the Government to say to us that it expected us to faithfully comply with the charter and build the canal and also state to the Governments of Nicaragua and Costa Rica that it would expect them to afford us every facility for building the canal under the respective concessions. Mr. Blaine then said:

I serve notice on you now that the Government does expect you to execute the charter faithfully and to build the canal, and if you do so you will have the Government with you. I will also cable the minister to Central America to go to Managua to look after our interests, and will send for the ministers to Nicaragua and Costa Rica and talk with them.

Our object in this conference was to determine the fact that we could go on with the work of building the canal and rely upon the support and protection of the United States, the power that had given us the charter, and we felt fully satisfied on that point.

I sent to Mr. Blaine, at his request, copies of all papers connected with the canal, beginning with the concessions.

I will say here that messages of congratulation on the organization of the company May 7 were exchanged between President Carazo, of Nicaragua, and myself, as president of the Maritime Canal Company.

Not long after this the Nicaraguan minister at Washington telegraphed his Government about the organization of the Canal Company, and said:

Costa Rica insists upon a director. If he remains, Nicaragua must recall its director. The company observes both concessions.

After our agent in Nicaragua had talked with President Carazo about this, the President instructed the minister in Washington to limit himself to protest, and assured our agent that Nicaragua would not hinder the beginning of the work. On the strength of Mr. Blaine's request to keep him fully informed, I wrote him June 21, 1889, stating that I had that day received a letter from Hon. Henry O. Hall, former United States minister to Central America, who had become our agent at Central America, advising me by cable that Nicaragua proposed to stop our work, which had been going on since June 3, on the ground that our surveys had not yet been approved by her engineers. I then wrote:

Our surveys were long since completed at great expense and received the approval of our engineers, and also of the able advisory board of five American engineers. Three months ago they were submitted to the two engineers appointed by the Government of Nicaragua.

And this obstruction to our work was notwithstanding the letter of Minister Zavala to Minister Hall on the 12th of October, 1888, in which Zavala says that the Government of Nicaragua—

Will not place any obstacles to the construction of the canal in accordance with her concession, but on the contrary will contribute with all those facilities within the power of the Government, anxious as it is to see the work carried on to a successful termination.

On the 16th of July, 1889, I went to Washington by request of the minister of Nicaragua, and at his request endeavored to allay any unpleasant feeling that existed between the Governments of Nicaragua and Costa Rica with reference to the canal concessions. He requested me to confer with the minister of Costa Rica on that subject. When I reached the residence of the latter he was about sending for me, and showed me a telegram from the President of Costa Rica asking me, as president of the Maritime Canal Company, to obtain the mediation of the United States Government. The result of repeated conferences between us was a letter addressed by me July 18, 1889, as follows:

MARITIME CANAL COMPANY OF NICARAGUA,
New York, July 18, 1889.

DEAR SIR: The Maritime Canal Company of Nicaragua respectfully asks you to direct the American minister at Central America to say to the Governments of Nicaragua and Costa Rica that, having learned of serious differences between those two Governments which affect the Maritime Canal Company of Nicaragua, the Government of the United States offers its mediation in regard to the same, and requests the said Governments to give their resident ministers at Washington full powers to confer with the president of the Maritime Canal Company of Nicaragua as to those differences, and then with him to submit the same and all questions relating thereto to the President of the United States for his decision, which shall be final and binding upon each and all of the said parties.

Very respectfully,

HIRAM HITCHCOCK,
President.

Hon. JAMES G. BLAINE,
Secretary of State.

This letter is approved by the ministers of those countries.

This letter, unfortunately, did not reach Mr. Blaine, who was absent from Washington, until some weeks afterwards.

On the 16th of September, 1889, I addressed Mr. Blaine the following letter:

MARITIME CANAL COMPANY OF NICARAGUA,
New York, September 16, 1889.

DEAR SIR: A crisis in the affairs of this company being at hand, it becomes necessary to submit the case, through you, to the Government of the United States, that we may be advised and protected. This is made easy on account of the great interest that you personally take in the enterprise, and the full liberty you have always given me to come to you. That we shall be protected through your wise aid and counsel, I well know, and have known, since your cordial assurances to that effect in Washington when I went out with Judge Daly and Chief Engineer Menocal, on the 7th of May, to announce the organization of the company under the charter granted by the United States. From that day we have felt, and now feel, that we can go in and build the canal, and rely upon protection by the power that granted us a corporate existence.

I have formally asked in writing the friendly aid of the Government, as will appear from my communications to you of June 21 and July 18, and I am aware that you directed Minister Mizner to Managua, where he now is. I have also written you from time to time of the progress of our affairs.

In my last letter of August 1, I strongly protested against the position taken by the Government at Nicaragua with reference to this company. On the 17th of August the Hon. Henry C. Hall, our agent at Nicaragua, was received very warmly by the new President, Dr. Sacasa, and had a most gratifying interview.

On the following day, August 8, Mr. Hall cabled me as follows:

"I have seen the President. He is favorably impressed with everything, and I have no doubt that matters can be settled in accordance with your wishes."

But on August 28 Mr. Hall wrote as follows:

"For a long time I have been convinced that there is some secret influence at work with the Nicaragua Government adverse to the company. This influence, in my opinion, is British. I don't say it comes direct from the British Government, but it comes from British capitalists who are anxious to get control of the enterprise. Mr. Climie tells me, as mentioned in a former letter, that the Blackman scheme could obtain all the capital it might need in London, and from what he let drop at the same time I was satisfied that his partner, Mr. Passmore, had conferred with Mr. Blackman in London, and that he (Climie) had conferred with him in New York. This influence has been more than ever apparent since the death of Mr. Carazo. I had counted upon Modesta Barrios as a friend of the enterprise, to be relied upon. I now find him imbued with the same ideas that were entertained by Urtecho in regard to the Costa Rica contract—that is, that while that contract exists Nicaragua must not permit the commencement of canal work; and further, that if on the 24th of October next, the limit of time which they claim for the commencement of the work, the company shall not have released itself from Costa Rica, the Nicaragua Government shall then declare its concessions forfeited. And these views, he says, are those of his associates and of the president. A few days before Carazo's death, he (Barrios) expressed to me that the action of the Government in refusing to permit the commencement of canal construction was unjustifiable. What influence could have been brought to bear upon him since he became a member of the cabinet, is more than I can imagine. The object of all this is clear to me. They hope to bring about a conflict between Costa Rica and the company; then Nicaragua will break with the company, and the latter will be left without the support of either. As matters now stand, Costa Rica is in honor bound not to permit that the canal shall fail, through her contract with the company, nor that Nicaragua shall so contemptuously ignore it.

"President Bogram, of Honduras, has sent as commissioner to Nicaragua and Costa Rica Señor Manuel Colindres, one of the most prominent and able public men of that State.

"He expects to receive the same appointment from the President of Guatemala. His mission is solely in regard to the canal, in whose success both presidents take great interest. I have had several conferences with him; have given him all the information at my disposal. He considers the attitude of the Nicaraguan Government wholly untenable. Before doing or saying anything to the Government, he will await the arrival of Mr. Mizner, so as to act in concert with him."

To-day Dr. Guzman notifies me, through Engineer Menocal, that he wishes me to call a meeting of the board of directors of this company (and which I have called for Thursday, the 19th) to present an important communication or ultimatum from his Government, the full nature of which I do not know, but one part of it is a demand that we shall break our contract with Costa Rica. The board will receive this official paper, and before acting upon it will undoubtedly appoint a committee to confer with you in this exigency.

I shall be glad to know by the bearer that you receive this, and at what time and place it may be your pleasure to receive such committee. Dr. Guzman will insist on an immediate reply, which it is not likely we will be able to give without first having a conference with you.

I was in hopes when you "served notice" on me personally, May the 7th, that the United States expected and required us to comply with our charter and build the canal, and also notified the ministers of Nicaragua and Costa Rica that the United States expected those two Governments would not obstruct but would aid in the great work, that all danger of difficulty had passed; but it seems they have paid no attention to the warning, and the assurances of the company that it would faithfully carry out its concessions under its charter, which it has thus far done, and our presence there in force and quietly at work since June the 3d, has not been received by them in a proper spirit.

Very respectfully,

HON. JAMES G. BLAINE,
Secretary of State.

HIRAM HITCHCOCK.

In this I inclose the following memorandum:

MEMORANDUM CONCERNING THE COSTA RICA CONCESSION.

The following is from the opinion of the Hon. Joseph E. McDonald, one of the incorporators of this company, and formerly counsel of the Republic of Nicaragua:

"The Menocal-Zeledon contract has been rendered necessary by the fact that at the time the Nicaragua concession was negotiated, Nicaragua assumed that the treaty of 1858 between herself and Costa Rica was not in force, and that after the President (then Cleveland) had declared it to be in force, and that the rights of

Costa Rica (under Article VIII) to be consulted with respect to any canal grant across the territory of Nicaragua that involved the valley of the San Juan River was more than advisory, it has then become necessary for the company to negotiate with Costa Rica or to entirely disregard her rights under that treaty."

I will add what I have before stated to you, that Nicaragua herself wished the company to come to terms with Costa Rica, and the company regards the Costa Rica concession as merely in the nature of a quit claim. And the Maritime Canal Company accepted this concession, with the following reservations:

"It is hereby understood, however, that the said concession is accepted by the Maritime Canal Company of Nicaragua upon the condition that nothing therein contained shall be construed to affect the sovereign rights or propriety in interests of the Republic of Nicaragua, so far as the same may have been established by the treaty of April 15, 1858, between the Governments of Nicaragua and Costa Rica."

To this Mr. Blaine sent the following reply:

PERSONAL.]

BAR HARBOR, *September 17, 1889.*

MY DEAR SIR: I have your favor and the accompanying memoranda. I am sorry to hear of the impending difficulties in the way of the Canal Company. But I do not think that Nicaragua or Costa Rica or both together will deprive you of your rights.

I go hence on the 23d instant to Richfield, N. Y., to witness the marriage of my son on the 26th, thence to New York and Washington, reaching the latter on the 30th of September.

Very respectfully,

JAMES G. BLAINE.

HIRAM HITCHCOCK, Esq.

On the 23d of September, 1889, I met Mr. Blaine in Boston by appointment, and was accompanied by Judge Daly and other gentlemen connected with the canal enterprise.

I stated to Mr. Blaine that we had received a communication from the Government of Nicaragua notifying the company that its concession would be forfeited October 24, unless the causes referred to in their ultimatum were removed—that is, unless we broke our contract with Costa Rica. He then carefully perused the papers submitted and asked what answer had been made, and was informed that the company had made no reply, but had appointed us as a committee to consult with him before replying to the communication.

After a full discussion of the matter, Mr. Blaine said:

The United States Government by granting to your company a Congressional charter practically guaranteed to give you such support as might be necessary for the protection of your rights. This obligation is not expressed in the charter, but exists just the same by implication. In other words, there is a moral obligation on the part of the Government to see that you have fair play. It would be absurd for the Government to incorporate you gentlemen for the purpose of doing a certain thing and then not to see that you are not deprived unjustly of your rights.

Mr. Blaine asked what rights were needed from Costa Rica, and Mr. Menocal showed him a plan of the canal route and pointed out to him how the dam at Ochoa would cause the flooding of the lands of Costa Rica.

After further discussion Mr. Blaine wrote and read to us the following dispatch, which he caused to be sent to Nicaragua, addressed to Minister Mizner:

The United States Government learns with surprise of rumors of an attempt to impair or deprive the Maritime Canal Company of Nicaragua of its rights as embodied in the contract granted by Nicaragua to that company. The United States can not understand how a company chartered under its laws should be treated with injustice by Nicaragua. You will please ascertain whence these disquieting rumors have arisen and communicate with me as soon as possible. You will also leave a copy of this dispatch with the Nicaraguan secretary of foreign affairs. The United States Government can not remain passive when the rights of a corporation organized under its laws are threatened with injustice.

The result was that on the 9th of October Mr. Blaine sent me the following dispatch:

HITCHCOCK, *Fifth Avenue Hotel, New York*:

Mizner telegraphs: "All difficulties settled. Papers executed in triplicate. This Government will retain one."

BLAINE.

Mr. Guzman telegraphed the same day:

Mr. HIRAM HITCHCOCK, *New York*:

I sincerely congratulate the company and yourself upon the good news received from Nicaragua.

H. GUZMAN.

The following messages were also sent October 9:

His Excellency PRESIDENT OF NICARAGUA, *Managua*:

Please accept my sincere congratulations upon the happy termination of all differences and the company's assurance that it will vigorously prosecute the work of the canal in the interest of Nicaragua and the whole commercial world.

HIRAM HITCHCOCK, *President*.

On the 11th of October the following dispatch was received:

President of the Maritime Canal Company of Nicaragua:

I congratulate myself jointly with you upon the happy settlement of the canal question, and with the greatest satisfaction I offer the cordial assistance of my Government to the efforts of the company for the realization of this grand enterprise.

ROBERTO SACAIZA,
President of the Republic.

On the 12th of November Mr. Hall, the agent of the company, cabled from Managua as follows:

The Government of Nicaragua has approved plans submitted by Chief Engineer Menocal for the Nicaraguan Canal entrance at San Juan del Norte. They are satisfied perfectly.

The agreement referred to in Mr. Mizner's telegram to Mr. Blaine, as signed in triplicate, was a joint declaration that the company on its part would adhere strictly to the concession, acknowledging the jurisdiction of the Nicaraguan Government over the canal and its ports, and Nicaragua on its part revoked the orders prohibiting formal beginning of canal construction, and approved the plans.

On the 18th of September, 1890, in a conference with Mr. Blaine at Bar Harbor, we went over the entire canal situation, especially considering the articles of noncompliance which would cause a forfeiture of the concession. We agreed that the only remaining cause of forfeiture would be the failure to do work upon the canal to the amount of \$2,000,000 on or before the 8th of October, 1890. I said to him that we had put much more than that into the work, and therefore no question should arise; but from the fact that we had had some misunderstandings with the Nicaraguan Government, I thought that I would take every precaution in the matter.

On the following day Mr. Blaine sent the following dispatch to Mr. Mizner at Central America:

Be at Managua from the 4th until the 10th of October. Witness the settlement of accounts between the Government of Nicaragua and the Nicaraguan Company and protect the rights and interests of this great American enterprise. If any question arises you will act judiciously but firmly for the full protection of such rights and interests.

During the conversation reference was made to the various attacks of the enemies of the canal, referring particularly to the last one, the

attempt to repeal our charter, and the admirable adverse report on that attempt which was made by Chairman Baker of the Committee on Commerce of the House of Representatives by the unanimous direction of the committee.

The Nicaraguan Government ascertained that more than \$2,000,000 had been expended on the canal and that therefore article 47 of the concession had been complied with, and later I received the following letter:

LEGACION DE NICARAGUA,
Washington, December 12, 1890.

My DEAR SIR: It affords me great pleasure to inform you that I am in receipt of a cablegram from His Excellency the President of Nicaragua, in which he directs me to inform you that article 47 of the concession has been fully and completely complied with.

In conveying this information to you, I desire to congratulate most heartily yourself and the other members of the Maritime Canal Company of Nicaragua for the success which so far has crowned the great enterprise.

I remain, dear sir, very truly, yours,

H. GUZMAN.

Mr. HIRAM HITCHCOCK,
President of the Maritime Canal Company of Nicaragua, New York.

As will be seen by article 53 of the concession, this last act in fulfillment of article 47 rendered the concession nonforfeitable.

On the 22d of August, 1893, Minister Guzman received in Managua from the minister of Fomento a full power of attorney giving him authority to settle and compromise with the company ad referendum any and all differences or claims which may arise from the failure of the company to comply with any of the provisions of the concession. Dr. Guzman returned to the United States late in September and was present at a meeting of the board of directors held November 2, 1893. The following is an extract from the minutes of said meeting:

The president asked Dr. Guzman whether, in view of his recent visit to Nicaragua, he had any information to present to the board. In reply, Dr. Guzman said that he wished to assure the company that the relations between the Government of Nicaragua and the company were of the most cordial nature, and that the Government was very desirous to aid the company in its work in every way possible; that his Government had given him full authority with reference to all matters connected with the canal, which authority he had exhibited to the president of the canal company, and he wished to assure the board that he should do everything in his power, both as minister and as member of the board, as well as an individual, to preserve the friendly relations between his Government and the company, and to promote the interests of the canal; and that when he failed to do that, he should insist upon resigning as the representative of his Government and as a member of this board; that he should do everything in his power in Washington this winter to secure cooperation of this Government in construction of the canal; and that if, after a reasonable time, such cooperation should be found not practicable, then he should advocate that his Government, in cooperation with the company, should go abroad for such financial assistance as might be found necessary to carry on the enterprise to completion.

I hereby certify that the foregoing is a correct copy.

THOMAS B. ATKINS,
Secretary and Treasurer.

Made January 28, 1897.

Since the said meeting of November 2, 1893, Dr. Guzman has repeatedly stated that it was his Government's intention to give the company all the time it needed to recover from the panic of 1893.

Soon after that we received notice of seizures of some of our property at Greytown, which we regarded as illegal, and I went to Washington with the papers bearing on the case and laid the matter before Secretary

of State Gresham, and on the 23d of April, 1894, Mr. Gresham cabled Minister Baker at Central America as follows:

It is reported here that property of the Maritime Canal Company has been seized at Greytown as the property of the construction company. Papers exhibited to me indicate that the seizure was unauthorized. You are expected to give the matter your attention and to do what you consistently can for the protection of the property and rights of the Canal Company.

On May 10, 1894, I received the following letter:

DEPARTMENT OF STATE,
Washington, May 9, 1894.

DEAR SIR: I have just received a telegram from Minister Baker, saying he can do nothing in the canal matter without the assistance of an able lawyer who understands the Spanish language and practice; that matters are in the worst possible shape; that the canal property has been virtually confiscated and the concession attacked.

Yours truly,

W. Q. GRESHAM.

HIRAM HITCHCOCK, Esq.,
New York City, N. Y.

On the 26th of April, 1894, I was surprised to receive a copy from Minister Guzman of a letter addressed by Señor Gamez of the Nicaragua cabinet, misdirected to the agent of the Interoceanic Canal Company at Granada April 7, 1894, which was in effect a notification that Nicaragua regarded the company's concession as forfeited. At the same time some of the company's property was seized at Greytown. The company then sought the protection of the power that created it, the United States, and the then honorable Secretary of State, the late Judge Gresham, reviewed the case, examined the concession, and arrived at the conclusion that there was no existing cause whatever for the forfeiture of the concession, and by his direction the United States minister at Managua cooperated with the general agent of the company, and the Government of Nicaragua withdrew the notice. And on the 2d of July, 1894, I received the following dispatch:

I have just received a telegram from Minister Baker, as follows:

"Gamez's letter forfeiting canal franchises withdrawn. All serene."

W. Q. GRESHAM.

I also received from Minister Guzman a copy of a cable from President Zelaya to him stating the same thing. On the 3d of January, 1895, Dr. Guzman was present at a meeting of the board of directors of the Maritime Canal Company, and I will read to you the following extract from the records of the meeting on that date:

Mr. Bryan asked for information as to the relations existing between the company and the Government of Nicaragua. Minister Guzman replied that they were of the most cordial nature—never were they so much so as at the present time; that the Government was most anxious to aid the company in the construction of the canal, and was ready to concede whatever might be necessary to insure success.

I hereby certify that the foregoing is a correct copy:

THOS. B. ATKINS,
Secretary and Treasurer.

Made January 28, 1897.

In the summer of 1895 the form of an agreement on the Tipepata Canal question was discussed at Managua between the Government of Nicaragua and the general agent of the Maritime Canal Company, and then the Government sent a special representative, Señor Gamez, with our agent, to New York, where the matter was further discussed and

changes were made in the form of agreement. It was also agreed and understood that the question could rest without prejudice to either party for a year.

In the summer of 1896 the special agent came again to New York, with the agent of the company, and on the 28th day of August, 1896, the consideration of the subject was further postponed until May, 1897.

On the 7th of July, 1896, the Hon. Lewis Baker, minister of the United States to Central America, wrote to me the following letter:

MANAGUA, July 7, 1896.

DEAR SIR: Mr. Christanto Medina, of Paris and Central America, remarked to me a few days ago that you and some of your confreres were uneasy lest this Government may take some steps to disturb or cast a shadow over the Maritime Canal concession; and he asked me my opinion as to such a probability.

I answered him promptly and with perfect assurance of the absolute correctness of my statement that the Government of Nicaragua has no intention of doing anything of the kind. Mr. Medina fully agrees with me in this.

To you I will say, the fact is that the movement or threat made prior to the visit of General Macaulay was nothing more nor less than a blackmailing scheme of a shrewd person, but he failed to find an accomplice in the general, and the threat was withdrawn in a legal and an honorable way.

Since that day the company has been in no danger whatever.

Further, I have had the positive assurance, and have had it several times repeated to me by the President, that nothing will be done by this Government to disturb the concession or to alarm its friends who are attempting to raise money for the prosecution of the work.

If both the Maritime Company and the Government of the United States show a desire to have the concession so changed as to permit the Government to build and control the canal, and therefore desire the time extended sufficiently to enable the latter to complete the work, I have the assurance of the President that such a change and extension would be readily agreed to by the Government of Nicaragua.

The fact is, since the Leon crowd have been completely banished, there is no longer any honest opposition to the canal.

I will say this for the President: Since the reorganization of the Government he is the undisputed master. He "sits at the head of the table." He is unselfishly in favor of the building of the canal by the present company, if it has the means, or by the United States Government.

I have satisfactory reasons for making this statement, and I am assured by Mr. Medina that his information accords with mine, as stated. This gentleman will be in New York soon, he informed me, and will no doubt see you.

No answer is required to this letter. It is written for the sole reason of giving you the assurances that are set forth in it. If they are worth nothing, they cost nothing.

Very truly, yours,

LEWIS BAKER.

H. HITCHCOCK, Esq., *New York.*

On the 23d of November, 1896, President Zelaya, of Nicaragua, wrote me as follows:

MANAGUA, November 23, 1896.

DEAR SIR: Your very esteemed letter of the 29th of October last, to which I have the pleasure to refer, reached me in due time.

By the contents of your letter I learn of the efforts made by you and by Mr. Wieser toward the organization of the works to build railroads in the country and also of coining, and which to you appear of feasible realization.

The country is at the present moment in very favorable conditions to undertake such enterprises and offers to immigrants all sorts of guarantees.

I trust that in conformity with your promise, as soon as the electoral campaign be over and confidence restored, you will kindly favor me with favorable reports in regard to the construction of the canal.

Once more I take pleasure in assuring you of my consideration and esteem, and please accept my thanks in the name of this Government for your wishes for the prosperity of the country over which it is my honor to preside.

I remain, respectfully, yours,

J. A. ZELAYA.

HIRAM HITCHCOCK, Esq.,
President the Maritime Canal Company of Nicaragua,
64 and 66 Broad Street, New York.

I was consequently amazed to read in the Congressional Record of January 22d instant, the letter addressed by Minister Rodrigues to the Secretary of State, and by him transmitted to the Senate, as follows:

DEPARTMENT OF STATE,
Washington, January 22, 1897.

SIR: In the matter of the various bills now pending in Congress looking to the construction of an interoceanic canal through Nicaragua, I have the honor to inclose herewith for the information of your committee a communication just received by me from the minister of the Greater Republic of Central America at this capital.

Respectfully, yours,

RICHARD OLNEY.

HON. JOHN SHERMAN,
Chairman Committee on Foreign Relations, United States Senate.

LEGATION OF THE GREATER REPUBLIC OF CENTRAL AMERICA,
Washington, January 15, 1897.

The undersigned, envoy extraordinary and minister plenipotentiary of the Greater Republic of Central America, has the honor to address his excellency the Secretary of State, informing him that as several bills relative to the construction of an interoceanic canal through Nicaragua have been for some time pending before both Houses of the American Congress, his Government recently instructed him to examine them, and to make, under certain conditions, suitable representations to his excellency the Secretary of State.

The undersigned has consequently examined said bills, which are five in number, to wit:

Three introduced in the House of Representatives—one by Mr. Mahon, December 3, 1895, another by Mr. Doolittle, and the third by Mr. Barham, both the latter having been introduced December 6, 1895.

Two introduced in the Senate, one by Mr. Perkins, December 30, 1895, and the other by Mr. Morgan, June 1, 1896.

All these bills take it for granted, with minor differences of detail, that the American Government is to take an important part in the enterprise, and that it is to furnish the money necessary for the construction of the canal by the Maritime Canal Company of Nicaragua, whose constitution and organization they essentially modify.

Unfortunately, the undersigned observes that the provisions of these bills are at variance, both generally and in matters of detail, with the stipulations of the contract of April 24, 1887, between Nicaragua and the company aforesaid, from which contract the company derives its existence and which is the basis of its enterprise.

That contract stipulates, in its eighth article, that the concession therein provided for shall in no case be transferable to governments or to foreign public powers, and Article LIII provides that any contravention of this stipulation shall entail a forfeiture of the contract. As it can not be denied that the bills to which the undersigned has reference—although they do not expressly say so—effect that transfer most fully, making the Government of the United States of America the absolute owner of the enterprise and of the canal and its rights, the result to which they inevitably conduce is the forfeiture of the contract.

Article XLVII of that instrument provides that the company shall undertake, at its own expense, the final surveys of the ground and the location of the line of the canal by a commission of competent engineers, two of whom are to be appointed by the Government of Nicaragua, and the aforesaid Article LIII provides that a failure to comply with this stipulation shall entail the forfeiture of the concession. The bills, however, provide that the canal shall be constructed under the surveillance of the Department of Engineers of the Army of the United States of America, and according to its plans; and that three engineers shall be designated by the President for that purpose, who shall make the explorations and estimates. This provision likewise conduces to the forfeiture of the contract.

"The people of all nations shall be invited to contribute the necessary capital to the enterprise. * * *

"Of the capital with which the company shall organize, and which it proposes to distribute among the different countries interested in the enterprise, there shall be reserved at least five (5) per cent for the Central American Government and citizens that may desire to subscribe." These provisions of Article VII of the contract are antagonized by the bills, which distribute the capital of the enterprise among the United States of America, Nicaragua, Costa Rica, and the company.

"The capital stock of the final company shall be composed of shares, bonds, or

obligations of any other kind, in such proportion as it may deem convenient." This is another provision of the ninth article. The bills, however, fix the amount of the capital stock in shares, of which they dispose in such a way that they are of no use for the work of the enterprise, as they ought to be according to the intent of the contract. For the work of the enterprise the bills create bonds, which must thus be converted into capital stock or be left out of the contract. The undersigned need not here point out the infractions which the bills involve.

According to Article X of the contract, the board of directors is to be composed of persons at least one-half of whom shall be chosen—by the company, of course—from the promoters who may yet preserve their quality as such. The bills organize the board of directors with 11 members, 8 of whom are to be appointed by the President of the United States, in different capacities, 1 by Nicaragua, 1 by Costa Rica, and 1 by the Canal Company. The difference between this provision and the stipulation referred to could not be more marked than it is.

Among the benefits which Nicaragua reserves to herself, in consideration of the valuable privileges and rights which she surrenders, is 6 per cent of the shares, bonds, certificates, or such other obligations as the company may issue with a view to raising the capital. Now, notwithstanding the fact that the company has made several issues, it has not fulfilled this obligation; and as the bills say nothing on this particular point of shares, bonds, certificates, or other obligations which were to be issued and have not been issued in favor of Nicaragua, these securities would probably either be lost in the new form of the enterprise, or would be liable to troublesome and tedious litigation.

Two of the bills in question have already been reported by a committee, so that they may finally exclude the others; nothing, however, is established in them with regard to the shares that would belong to Nicaragua; and it might happen, owing to this, that Nicaragua would get none at all.

If the company were to issue a hundred or a hundred and fifty million dollars' worth of bonds in order to meet the cost of the work, which bonds, as I have already remarked, would have to be considered as capital or be left out of the contract, Nicaragua would be entitled to her 6 per cent in virtue of the stipulation above referred to; but the bills leave no door open to such a possibility, nor do they allow her any participation in the issue which is to be made in order to pay for the work already done.

The company, by article 14 of the aforesaid contract, has contracted the solemn obligation to construct, at its own expense, within the term of three years, reckoned from the commencement of the work upon the interoceanic canal, a navigable canal between Lake Managua and the navigable part of the Tipitapa River, near Pasquier, of sufficient dimensions to admit of the free passage of vessels drawing six feet and of 150 feet in length. That term expired a long time ago, but the company, notwithstanding the most earnest solicitation, has made no pretense of meeting that obligation, or of definitely adjusting the compensation which it ought to pay in order to be discharged therefrom. The bills establish nothing on this other point, and Nicaragua's rights in this matter might thus be annulled in consequence of their silence.

By the plan involved in the new form which the bills devise for the enterprise, the present company is extinguished, and nothing remains of it, in its relations with the enterprise, save the shadow of a personality represented by a vote in a board of directors of eleven members; while in its relations with Nicaragua it may always claim full personality as the holder of the concession, although having none of the means necessary to enable it to meet its obligations.

Finally, it is to be observed that, while the bills contravene and set at naught stipulations of the contract, they do not state whether the remaining ones still remain in force or not, although among these latter there are very many which are of no great importance to Nicaragua in particular, and to Central America in general.

The undersigned is convinced of the good faith of the gentlemen who have introduced these bills in both Houses, and of those who advocate their passage; he takes, moreover, pleasure in stating that he recognizes these efforts as the result of the legitimate interest which they feel in behalf of the construction of an interoceanic canal, in which the confederation that he represents is quite as deeply interested. And, in calling attention to the serious objections enumerated, which would render these efforts nugatory, the only object that he has in view is to protect just rights which he thinks are menaced by the bills aforesaid.

It seems evident that the company is unable to raise money to fulfill its contract unless the United States of America furnish it therewith, and since that contract excludes the possibility of attaining that result, the undersigned, having been duly authorized to do so, proposes to his excellency the Secretary of State that the two Governments—relying upon the favorable disposition of the Government of the United States of America—shall come to a direct understanding on the subject, on the basis of the Zavala-Frelinghuysen treaty, with such modifications as may be agreed upon, and endeavoring to reach a just arrangement with the Maritime Canal

Company of Nicaragua, so that it may renounce a concession whose conditions it is unable to fulfill.

The undersigned, in thus obeying the instructions of his Government, avails himself of this occasion to reiterate to his excellency Secretary Olney the assurances of his most distinguished consideration.

J. D. RODRIGUEZ.

His Excellency RICHARD OLNEY,
Secretary of State of the United States, etc., Washington, D. C.

I replied to this letter on January 23 as follows:

THE MARITIME CANAL COMPANY OF NICARAGUA,
New York, January 23, 1897.

DEAR SIR: My attention has been called to the Congressional Record of January 22, containing a copy of a letter addressed by the minister of the Greater Republic of Central America at Washington to you, and transmitted by you to the Senate, in which the minister reflects upon the Maritime Canal Company of Nicaragua, a company chartered by the United States, and which company, in compliance with a provision of said charter, reports annually its transactions to the Government of the United States, through the Department of the Interior, and which holds concessions from the Governments of Nicaragua and Costa Rica, under which the construction of the Nicaragua Canal has been commenced and is to be completed.

It therefore becomes my duty to briefly call your attention to some of the statements contained in the minister's letter, and to note some omissions. Referring to certain bills before the Congress of the United States, he says that "the bills, however, provide that the canal shall be constructed under the surveillance of the Department of Engineers of the Army of the United States of America and according to its plans;" and adds, "this provision likewise conduces to the forfeiture of the contract." But he omits to inform you that the final surveys and the location of the line of the canal were made and concluded by a commission of engineers, in strict conformity with Article XLVII of the concession, and were formally accepted by the Government of Nicaragua on the 8th day of October, 1889.

He quotes from Article IX of the concession, "the people of all nations shall be invited to contribute the necessary capital to the enterprise," but omits the remainder of the sentence, namely, "and it shall be sufficient for the fulfillment of this requirement to publish an advertisement for thirty consecutive days in one of the principal daily papers of each of the cities, New York, London, and Paris." He quotes further, "there shall be reserved at least 5 per cent for the Central American Governments and citizens that may desire to subscribe," but he omits to inform you that soon after its organization the company fully performed all these conditions of Article IX in the manner required therein.

Referring to the 6 per cent of shares that the concession obligates the company to issue to Nicaragua, the minister says the "company has not fulfilled its obligations." The fact is that the company issued this stock to Nicaragua on the 31st day of October, 1890, and notified that Government that the certificate was at its disposal, but the Government has not yet appointed an agent to receive the same as provided in Article L of the concession.

The minister states that the company has failed to meet its obligations to construct the Tipitapa Canal under the terms of Article XIV of the concession. As to this, I will say that the surveys for the canal as described in Article XIV were made, and then the Government of Nicaragua asked for a deeper canal than the concessions provided for. Before a resurvey was completed a desire was expressed for a still deeper canal. Pending negotiations on this subject, and notwithstanding the fact that the Government had failed to place at the disposal of the company the lands required for the line of the canal, the Government issued a notice to the effect that it considered the canal concession forfeited. The company then sought the protection of the power that created it—the United States—and the then honorable Secretary of State, the late Judge Gresham, reviewed the case, examined the concession, and arrived at the conclusion that there was no existing cause whatever of forfeiture of the concession, and by his direction the United States minister at Managua cooperated with the general agent of the company, and the Government of Nicaragua withdrew the notice. Whether the Tipitapa Canal will be constructed and of what dimensions, or whether compensation will be made in lieu thereof, are matters still under negotiation, and any differences that may arise in the consideration thereof are not causes of forfeiture, but are to be settled by arbitration under Article LV of the concession.

While the honorable minister may not have intended any injustice to the company by his letter, yet he must be supposed to have made a careful study of the canal question, the concessions and the operations under them, and if so his letter seems inexplicable.

It would appear from his letter that a contemplation of possible Congressional action in amending the charter of the Maritime Canal Company has interposed itself between him and the true relations existing between the Government of Nicaragua and Costa Rica and this company under the concessions.

In this connection it is pertinent to say that in an interview with the honorable minister since his arrival from Central America I alluded to the bills before Congress, and stated to him in substance that they were generally believed to be the result of a strong desire on the part of the Congress to hasten the construction of this vitally important connection with the coast lines of this continent; and I added that whatever the outcome might be, the Maritime Canal Company could accept of no measure that would be unjust to the powers from whom it received the concessions.

This letter of the minister is an attack upon the integrity of the Maritime Canal Company and its concessions, and on behalf of that company I ask the protection and aid of the Government of the United States in the defense and maintenance of its concessionary rights and its property.

Very respectfully,

HIRAM HITCHCOCK,
President of the Maritime Canal Company of Nicaragua.

HON. RICHARD OLNEY,
Secretary of State.

The CHAIRMAN. Now, Mr. Hitchcock, do you know in what manner the passage of the bill by the Senate in January, 1895, was received by the minister of Nicaragua, then resident at this capital, and what expression he gave as to the happiness of the people and Government of Nicaragua over the passage of that bill, if any?

Mr. HITCHCOCK. In reply, I will say that on the last day of January, 1895, I received the following letter from Minister Guzman:

WASHINGTON, January 30, 1895.

DEAR MR. HITCHCOCK: I was sorry you could not be here the day our bill passed the Senate, but I saw by your telegram that you were detained by a sad loss in your family.

I should have written you before this about the great victory, had I not been sick. I was taken with a bad attack of quinsy, and I only left my bed yesterday.

Please accept my congratulations for the success of the bill, and let me hear, as soon as possible, about your future plans. I am sure that my cablegram announcing the victory was received with joy in Nicaragua.

Very sincerely, yours,

H. GUZMAN.

Later I received a letter from the Hon. Lewis Baker, minister to Central America from the United States, written from San Jose Costa Rica, on the 28th of January, 1895, saying:

I have a telegram from the general minister of Nicaragua this morning informing me that the canal guarantee bill had passed the Senate. If this good news is confirmed I shall fully expect the bill to pass the House. If this proves true won't you do me the favor to cable me promptly, giving me the facts? On the statement of the Nicaragua minister I have sent congratulatory messages to both the Nicaraguan and Costa Rican Governments.

The CHAIRMAN. From the fact that you had made a full statement of all of your troubles with Nicaragua, if I may call them troubles, and that the Government of Nicaragua had expressed itself as being fully satisfied that all the terms of the concession had been complied with, and after receiving this letter from Mr. Baker, which you have just quoted, and after receiving the letter which is above set out from President Zelaya, and after receiving the letter from Mr. Guzman, which you have just quoted, did you have any suspicion or expectation that there was any real remaining difficulty or difference between your company and the Government of Nicaragua?

Mr. HITCHCOCK. I had not, except that the Tipitapa question was a matter that we were arranging for arbitration, if necessary.

The CHAIRMAN. And that matter had been postponed for that purpose?

Mr. HITCHCOCK. That question had been postponed.

The CHAIRMAN. The Tipitapa Canal had no connection whatever with a right of forfeiture on the part of Nicaragua of the concession, and if there was any possible default on the part of the company, which I understand you to deny, the arrangement or settlement of that matter was entirely apart from your right to go on and build the main canal?

Mr. HITCHCOCK. Entirely apart.

The CHAIRMAN. Are you yet convinced, notwithstanding the protest of the minister from the Greater Republic of Central America, that Nicaragua is friendly to your company and desires to see the canal succeed?

Mr. HITCHCOCK. My belief is that President Zelaya and his present administration in Nicaragua are very friendly to the company and exceedingly desirous to have the canal completed, and I believe them to be desirous that the company shall be aided by the United States in order that the completion may be hastened.

The CHAIRMAN. Is there not a remaining jealousy or antagonism between Nicaragua and Costa Rica, growing out of old disputes, which has not been entirely quieted, and with which you have no concern, and may not that jealousy be at the bottom of the movement of the Greater Republic of Central America?

Mr. HITCHCOCK. That is quite possible and may be more than that. It may be highly probable, but the company has but one object and that is to carry out both its concessions from those Governments in the utmost good faith under the charter granted by the United States.

The CHAIRMAN. Has not your company put itself to a great deal of trouble, inconvenience, and expense in the effort to reconcile those two Governments with each other upon the subject of the construction of this canal?

Mr. HITCHCOCK. We have done our best in that direction frequently for the last ten years, as will be shown by what I have already stated before the committee.

The CHAIRMAN. It has been asserted that your company is bankrupt. Is that true?

Mr. HITCHCOCK. That is not true. The Maritime Canal Company of Nicaragua is and always has been entirely solvent and has no outstanding debts we are not able to meet. Anyone making a different statement confuses the Maritime Canal Company with the Construction Company, which held a contract with the Maritime Canal Company to construct the canal and which was obliged to suspend and go into liquidation in 1893. This latter fact is not surprising when it is remembered that during that period of great financial depression such vast corporations as the Erie Railroad, the Baltimore and Ohio, the Reading, and the Union Pacific were obliged to default on their obligations and to resort to reorganization of their companies.

HIRAM HITCHCOCK.



REPORT

OF THE

ACTING SUPERINTENDENTS OF THE YOSEMITE NATIONAL PARK.

REPORT OF ACTING SUPERINTENDENT J. W. ZEVELY.

DEPARTMENT OF THE INTERIOR,
Washington, January 6, 1899.

SIR: In compliance with your instructions, I have the honor to submit the following report of the performance of my duties as acting superintendent of the Yosemite National Park during the summer of 1898, and to make certain recommendations touching the same.

Under directions contained in your letter of May 26, 1898, I proceeded to the Yosemite Park in California to investigate the condition of affairs in that park. Under the instructions contained in said letter, I occasioned suitable notices to be published in the following newspapers: The Merced County Sun, of Merced; the Weekly Evening Expositor, of Fresno; the Weekly Republican, of Fresno, and the Mariposa Gazette, of Mariposa, warning all persons against trespassing on the parks. I also occasioned numerous notices to be posted in prominent places at the various entrances to the park, warning all persons against trespassing.

In obedience to your telegram of June 17, 1898, I assumed the duties of acting superintendent of the Yosemite Park, and immediately appointed, by authority of said telegram, 11 men as forest agents for the purpose of expelling trespassers from the park. Special Agents Cullom, Buick, Pryor, and Langenberg, of the General Land Office, under your direction, reported to me for duty. Messrs. Cullom and Buick were each placed in charge of a squad of men in the Yosemite Park, and Pryor and Langenberg were dispatched to Sequoia and General Grant parks.

I kept Messrs. Cullom and Buick constantly in the field expelling trespassers, extinguishing fires, and capturing firearms until September 1. During the time they were in the field, from June 25 until September 1, we expelled from the park 189,550 head of sheep, 350 head of horses, 1,000 head of cattle, and captured 27 firearms. On September 1 the civilian rangers, under Agents Cullom and Buick, were succeeded by Capt. Joseph E. Caine, with the First Utah Volunteer Cavalry, and from then until September 24, when I was succeeded by Captain Caine as acting superintendent, 24,500 head of sheep were driven from the park and 3 additional firearms were captured, making a total of 214,050 sheep expelled from the Yosemite Park and 30 firearms captured.

In addition to the expulsion of trespassing herds the forces in the field had numerous forest fires to contend with, some of them being of such extensive character that we were almost powerless to make any headway against them. The drought had been of long duration, and

hence the forest with the accumulation of débris on the floor of the mountains and the valleys was extremely dry and the fires spread with great rapidity. In one or two instances serious damage was done to the growing forests by these fires.

Under the existing law, no penalty attaches to the offense of trespassing upon this park other than that which the superintendent may inflict in the way of dispersing herds, capturing pack trains, camp equipage, and stock, and occasioning the owners and herders to leave the park. This fact is generally known in California and Nevada, and in connection with the severe drought which obtained in that region during the past year, made them bold to enter and remain upon the park.

RECOMMENDATIONS.

I beg leave to make the following recommendations:

1. That you urge upon Congress the necessity of the enactment of a law attaching a penalty for trespassing upon the national parks, and that some officer connected with the government of the park be given the same powers as are now vested in the United States commissioners, so that trials may be had as speedily as possible after the apprehension of the trespassers.

2. That you urge upon Congress the necessity of extinguishing the titles which now subsist in individuals to lands within the park limits. As long as there is private ownership of lands within the limits of the park it will be with the utmost difficulty that the stock can be kept off the park and the game and fish within its limits protected.

3. That a permanent barracks be established at Camp Wood, near Wawona, of sufficient capacity to accommodate an officer, a surgeon, and 20 men, for the purpose of protecting the park during the winter months when the troops have been withdrawn. A detail of the size here indicated should be kept there all the winter. There are many times during the winter when the park is very accessible to hunters and trappers, the consequence being that much of the game and fish within the park is destroyed.

4. The roads which have been constructed for the purpose of accommodating the general public who wish to visit the National Park ought to be owned by the Government. Persons going there either for pleasure or health ought not to be required to pay for traversing roads which are upon the park itself. The roads which ought to belong to the Government are the Yosemite Stage and Turnpike Company's road from Wawona to the Yosemite Valley; the Big Oak Flat road, which enters the park about 3 miles west of Crocker's and runs into the Yosemite Valley at the foot of El Capitan; the Coulterville road, which crosses the park line about 3 miles south of the Big Oak Flat road and runs to the lower end of the Yosemite Valley. Many of my predecessors have recommended the purchase of the Tioga road. I do not think this should be done, as the Tioga was not originally constructed even for a quasi public purpose, but merely to enable the owners of the Tioga mine to have an outlet from their mine to the market. This is not a toll road and never has been; it has been abandoned by the builders for more than twenty years; if they ever had any rights, they have lost them by abandonment. I think appropriations should be made for the repair of this road, but I think none ought to be made for its purchase, as I conceive it already belongs to the Government.

5. In the matter of the prevention of forest fires, from conversations had with old mountaineers, men who have lived in the Sierras since the

fifties, who have been constant observers of the conditions there, and who are deeply interested in the preservation of the forests in the national parks, as well as the national reservations, I have concluded that the policy heretofore pursued by the Government, looking to the prevention of fires altogether, is erroneous. Since the Yosemite Park was established, great efforts have been made by each superintendent to prevent fires altogether, and when they have started, to prevent their spread. The consequence of this is that the floors of the mountains and the valleys have become covered by decaying pine needles and cones and the leaves of the deciduous trees to a depth of from 12 to 18 inches; in addition, many trees have fallen and are now decaying, and the whole mass is highly inflammable. The consequence is that when fires start under existing conditions it is next to impossible to control them at all, and the trees in the track of a fire are destroyed. Prior to the inauguration of the present policy, fires occurred almost every year in all parts of the forest—in fact, they were frequently set by the Indians, but there was so little accumulation on the ground that they were in a great measure harmless, and did not in any sense retard the growth of the forest.

I therefore think it would be well to consider whether or not the policy of the Government had not better be reversed and, instead of efforts to prevent fires, a systematic burning had not better be indulged. There is not to be found now in the whole forest any tree of great magnitude which has not upon it the marks of fire, yet the trees have in no wise been seriously affected by these burnings.

In conclusion, I beg leave to suggest that the Yosemite National Park ought to be placed upon the same footing as the Yellowstone National Park. While no official records are kept of the number of persons who annually visit the Yosemite National Park and the Yosemite Valley, yet I think the number of tourists and visitors is quite equal to the number visiting the Yellowstone. From the report of the superintendent of the Yellowstone Park for the present year, I see the total number was 6,534. The books of the Yosemite Stage and Turnpike Company show that for several years last past the number of tourists carried by it has averaged more than 2,500 annually. When we take into account that there have been in operation two other stage lines, and that many persons go in by private conveyances, and on horseback and on bicycles, it is reasonable to conclude that the total number of tourists is equal to the total number visiting the Yellowstone annually. The further fact that the troops that were designed for the protection of the Yosemite during the season just closed were withdrawn on account of the war with Spain, thus leaving the park wholly unprotected, makes more apparent the urgent necessity of providing for the permanent superintendency and patrol of this park.

I beg leave to submit herewith (Exhibit A) a letter from Dr. Marsden Manson, who has made a study of the flora of the Sierra for many years past; also a letter (Exhibit B) from Dr. Marsden Manson and W. L. Ashe, members of the department of highways in the State of California, making some suggestions relative to the roads and trails within the park.

Very respectfully,

J. W. ZEVELY,
*Special Inspector, Acting Superintendent of the
Yosemite National Park.*

The Honorable,
The SECRETARY OF THE INTERIOR.

INT 98—MIS—67

EXHIBIT A.

SENTINEL HOTEL,
Yosemite, Cal., June 17, 1898.

SIR: In studying the west slope of the Sierra Nevada for the past twenty years I have been impressed with the fact that there are many species of the flora of that region which are being destroyed by various agencies, but particularly by sheep and forest fires. There are also several species (notably the big trees) which are disappearing from natural causes.

To preserve these I recommend—

(1) That the Yosemite Reservation be designated and set apart as an area devoted to the preservation of the distinctive flora of the Sierra, and that the policy of the Department be to encourage Government, State, and private aid to this object.

(2) That the introduction of foreign species be forbidden, and that those already introduced be systematically destroyed.

(3) That the Sierra Club, the College of Agriculture of the University of California, or the Smithsonian Institution, be charged with the duty of carrying out this work under the direction of the honorable the Secretary of the Interior.

Very respectfully,

MARSDEN MANSON.

J. W. ZEVELY, Esq.,
Special Inspector, Interior Department.

EXHIBIT B.

SENTINEL HOTEL,
Yosemite, Cal., June 17, 1898.

SIR: As the work with which we are charged has certain general relations with our duties, we submit for your consideration the following:

First. It is desirable for the Government to acquire those portions of existing toll roads entering the Yosemite Valley which lie within the lines of the reservation, the basis of these values being (a) the cost of constructing the same at present; (b) the values of the roads and franchises as given by the assessors' books of the counties in which said roads are situated.

Second. The conditions of such acquisition being that all tolls should be reduced during the remainder of the franchises in proportion to the lengths of toll roads left beyond the limits of the reservation, and that such remaining portions be made free roads at the expiration of existing franchises.

The Tioga road traverses the reservation and approaches desirable passages through the Sierras to the easterly counties of California and to the State of Nevada.

A bill for the extension of this road passed the last California legislature, but failed to become a law by reason of certain defects in the title. It is probable that this will be remedied in the future and that the State of California will construct the extension easterly to the road system of Mono County. This road has been abandoned entirely for several years, and it is doubtful whether the State laws regarding the acquisition of the right of way and franchise have been fully complied with. We therefore are of the opinion that this road should be taken possession of by the Government and maintained as a line of travel and police control. It is also respectfully urged that existing and possible lines of road be examined and surveyed, and that upon the basis of such surveys and examinations a road be jointly constructed and maintained by the Government and State along the best grades and alignments which the nature of the country will afford.

In the matter of the passage and pasturage of stock in the reservation, we believe—

(1) That such passage should be restricted to cattle, horses, mules, and asses; that sheep and goats should be absolutely prohibited.

(2) That a light toll should be charged upon such stock in transit.

(3) That a pasturage charge should be made.

(4) That the number should be restricted so as not to overstock the ranges and meadows.

(5) That the charges thus collected should be used for the maintenance of the roads of the reservation.

Very respectfully,

MARSDEN MANSON,
W. L. ASHR.

Members Department of Highways, State of California.

J. W. ZEVELY,
Special Inspector, Department of the Interior.



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